New Perspectives on Household Archaeology

edited by Bradley J. Parker and Catherine P. Foster

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Participants in the University of Utah Middle East Center conference "Household Archaeology in the Middle East and Beyond: Theory, Method, and Practice," Salt Lake City, Utah, February 2009.

Front Row (from left): Chantel White, Rana Özbal, Lynn Rainville, Roger Matthews, M. Barış Uzel, Isaac Ullah, Lauren Ristvet, James Hardin.

Back Row (from left): Emily Johnson, Jeffrey R. Chadwick, Nicholas Wolff, Reilly Jensen, Meredith Chesson, Stuart Campbell, Catherine P. Foster, Philip Graham, David Frankel, Bradley J. Parker, Jennifer Webb, Wendy Matthews, Marie Hopwood, Sarit Paz, Pati Wattenmaker, Ruth Tringham, Arlene Rosen, Christine Hastorf, Stella Souvatzi, Mila Hover, Sue Ann McCarty.

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Edited by

BRADLEY J. PARKER AND CATHERINE P. FOSTER

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Preface

The essays in this volume represent substantially revised versions of papers presented at the conference *Household Archaeology in the Middle East and Beyond: Theory, Method, and Practice*. This three-day meeting took place between February 19 and 21, 2009 at Fort Douglas on the campus of The University of Utah in Salt Lake City. Substantial funding for the conference and for this book was provided by the Middle East Center at the University of Utah as part of their Title VI grant from the U.S. Department of Education. Additional support was also provided by the Office of the Vice President for Research and the College of Humanities at the University of Utah. We are grateful to Ibrahim Karawan, Thomas Parks, and Robert Newman for their support. We are also indebted to the staff of the Middle East Center, especially Sheri Lindsay, who provided technical and organization support leading up to and during the conference. We would also like to thank Jim Eisenbraun and his editorial staff for their assistance in this project. Finally, we wish to thank the contributors to this volume for the time and effort they invested in preparing their articles.

BRADLEY J. PARKER
CATHERINE P. FOSTER

Contributors

MEREDITH S. CHESSON
Department of Anthropology, University of Notre Dame

JEFFREY R. CHADWICK
Jerusalem Center for Near Eastern Studies, Brigham Young University

CATHERINE P. FOSTER
Ancient Middle East Education and Research Institute

DAVID FRANKEL
Archaeology Program, La Trobe University

PHILIP GRAHAM
Department of Anthropology, University of Connecticut

JAMES W. HARDIN
Department of Anthropology and Middle Eastern Cultures, Mississippi State University

MARIE HOPWOOD
Department of Sociology and Anthropology, Central College

J. MARK KENOYER
Department of Anthropology, University of Wisconsin-Madison

AREN M. MAEIR
Martin (Szusz) Department of Land of Israel Studies and Archaeology, Bar-Ilan University

ROGER MATTHEWS
Department of Archaeology, University of Reading

WENDY MATTHEWS
Department of Archaeology, University of Reading

SIDDHARTHA MITRA
Department of Geological Sciences, East Carolina University

YOKO NISHIMURA
Department of Anthropology, Stony Brook University

RANA ÖZBAL
Department of Archaeology and History of Art, Koç University

BRADLEY J. PARKER
Department of History, University of Utah

SARIT PAZ
The Martin Buber Society of Fellows in the Humanities, The Hebrew University of Jerusalem

LYNN RAINVILLE
Tusculum Institute, Sweet Briar College

ARLENE M. ROSEN
Department of Anthropology, University of Texas, Austin

ALEXIA SMITH
Department of Anthropology, University of Connecticut

STELLA SOUVATZI
School of Humanities, Hellenic Open University, Greece

RUTH TRINGHAM
Department of Anthropology, University of California, Berkeley

ISAAC I. T. ULLAH
School of Human Evolution and Social Change, Arizona State University

JENNIFER M. WEBB
Archaeology Program, La Trobe University

CHANTEL E. WHITE
Department of Anthropology, University of Notre Dame

NICHOLAS P. WOLFF
Department of Archaeology, Boston University

Introduction: Household Archaeology in the Near East and Beyond

Catherine P. Foster and Bradley J. Parker

Thirty years ago, Richard Wilk and William Rathje coined the phrase "household archaeology" in their seminal issue of *American Behavioral Scientist* (Wilk and Rathje 1982). Since that time, household archaeology has become a subfield as diverse in theoretical underpinnings as it is in practical applications. Even the definition of household archaeology can be outlined in several ways: (1) a subdivision of settlement archaeology specializing in the study of spatial patterning at the household level; (2) a development from social archaeology presenting more humanized reconstructions of the past; or (3) simply as the study of household-based behaviors and relationships. All of these approaches to what is widely considered a basic unit of society are represented in this volume, which serves as the latest incarnation of household studies based on a long intellectual development. Although more detailed discussions of the history of household archaeology are available elsewhere (Allison 1999; Ashmore and Wilk 1988; Steadman 1996; Tringham 2001, this volume), we find it useful to summarize key aspects of this development here to better situate contributions by Near Eastern archaeologists within the wider field.

Scholarly interest in domestic groups has deep roots in the cultural and anthropological studies of family and kinship systems dominant in the early 20th century. In seeking to define the universality of the family or residence rules for the generation of household units, early anthropologists assumed that household forms were not the result of variable patterns of behavior but were instead the outcome of systems of marriage and residence rules (Netting et al. 1984: xvi). To move beyond this conceptualization, many anthropologists and archaeologists began to envision the household as a nonstatic entity whose structure was affected by many interlocking factors. The earliest example of this is the "developmental cycle of domestic groups," a theoretical framework that likened household forms to the growth cycle of living organisms (Fortes 1958). While this theory highlighted the social, economic, and morphological transformations each household group undergoes during its lifecycle, its emphasis on uniformity and generalization limited its applicability. A similar disconnect existed in early archaeological categorizations of household groups in which scholars, largely influenced by ethnographic research, favored narrow conceptualizations of households based on kin-based family structures. In a defining move, some anthropological archaeologists chose to separate the family as a self-identified kinship entity from households, which they saw as co-residential groups. Thus, households came to be understood as groups of individuals who share both a habitation space and sets of activities centered on the day-to-day necessities of living (Bender 1967).

With the advent of the processual archaeology movement in North America, the archaeological study of households began to develop formally. Material culture came to be seen not as traits to be listed and categorized but as evidence of human behavior. At this time, archaeologists also sought ways to augment their approaches to the material record by integrating various scales of analysis in their research designs. Scholars increasingly focused their attention on the inner-workings of societies by examining the variation within and between households and by theorizing how various internal and external processes affected the composition of domestic groups (Clarke 1972; Rapoport 1969; Whiting and Ayres 1968). These approaches were collectively exemplified by Kent Flannery's (1976) edited volume on the origins of village life and Formative Period households in the Valley of Oaxaca. In this book, Flannery and contributing authors explored house structure, specialized and gender-specific activity areas, and exchange on local and regional scales. Following this trend, Wilk and Rathje (1982) and several others (Ashmore and Wilk 1988; Wilk and Netting 1984) addressed the problems inherent in attempting to derive the morphology of household groups from the archaeological record by emphasizing the functional aspects of household activities and behaviors. In so doing, they focused attention on what households do and how they interact in their individual sociocultural environments. In these studies, ethnographic analogy and ethnoarchaeology were championed as tools for relating intangible behavior patterns to their material traces (Ashmore and Wilk 1988: 12), a view promoted in later ethnoarchaeological and activity-area research (Blanton 1994; Horne 1994; Kent 1990; Kramer 1982b; Watson 1979).

The innovative work of Wilk, Rathje, Ashmore and others gave promise that households could serve as linking agents between theories of social change and material culture—a key principle upon which the discipline of household archaeology is now largely based. However, these scholars also conceded that, far from being standardized and static agents, households were dynamic in function, form, and behavioral activities that could vary from place to place and through time (Ashmore and Walk 1988: 3; Wilk and Rathje 1982: 621). Instead of leading toward a unified approach to the study of ancient households, this ambiguity has precipitated the diversification of the subfield. Household archaeology has since transformed into a variety of approaches incorporating economic models of the domestic mode of production (Donham 1981; Sahlins 1972; Wilk 1989) and various Marxists ideas pertaining to social inequality, ideology, and power (Rathje and McGuire 1982). Post-processual or interpretive archaeologies have also had a significant effect on the exploration of household social practice and embodied spaces (Bourdieu 1977; Hendon 2004; Hillier and Hanson 1984; Hodder 1990), feminist anthropology, and gendered places (Brumfiel 1991; Costin 1996; McGaw 1996; Meyers 2005; Moore 1988; Tringham 1991, 1994).

It could rightfully be argued that the maturity of household archeology as a subfield has since derived from the extensive work of archaeologists researching in Europe and the Americas, Mesoamerica in particular.[1] But this volume and others can attest to the groundbreaking work being carried out in Southwest Asia, especially in the area of household methodology. In particular, the Neolithic and ʿUbaid Periods in the Near East have garnered great interest by scholars studying the adoption of sedentary agricultural practices, the effect of agriculture on cultural systems, and, in turn, how this is manifest in architectural remains. Work at sites like ʿAin Ghazal, Çatalhöyük, Çayönü, and Tell Mudhhur have, for example, highlighted the relationships among social crowding, the construction of physical boundaries, the life-histories of individual house structures, and the development of a concept of "home" (Banning 2003; Byrd 2000; Chesson 2003; Hodder and Cessford 2004; Kuijt 2000; Roaf 1989; Tringham and Stevanovic 2012; Verhoeven 1999; Watkins 1990). Scholars investigating early and developed urbanism often look to the Near East, where the study of households has been used to explore social developments within neighborhoods in Mesopotamian cities and towns of the fourth through second millennia (Brusasco 1999–2000; Pfälzner 1996; Pollock et al. 1996; Stone 1996; Wattenmaker 1998). There is also a long history of archaeologists working in the southern Levant, and their analyses of architectural forms, domestic economies, and written documentation have shed enormous light on the composition of families and daily lives of peoples living in this region (Daviau 1993; Ilan 2001; King and Stager 2001). Finally, practitioners of household archaeology in the Near East are developing an array of innovative analytical techniques including microdebris analysis, microstratigraphy, soil characterization, and digital visualization (Matthews et al. 1997; Rainville 2005; Rosen 1986, 1989; Tringham et al. 2007). When combined with newly invigorated approaches to ethnoarchaeology and activity-area research (Kamp 2000; Parker 2011), these methods are allowing unprecedented access to the residue of activities carried out by members of ancient households.

In spite of the fact that household archaeology has become integral to archaeological practice, this brief discussion shows that it remains a diffuse subfield with few unified conceptual or practical approaches. The application of a household archaeological approach to specific case studies and larger social questions from the ancient Near East has also yet to be comprehensively addressed. This is especially true for preliterate societies that, despite a previous critique (Veenhof 1996), can offer a rich narrative of social lives as reflected and enacted through the household. The primary goal of the 2009 conference upon which this volume is based was to address these issues by bringing together scholars from around the world whose research interests focus on some aspect of the theory, method, and practice of household archaeology. More specifically, participants revisited conceptualizations of the household in both past and present societies, evaluated the place of household archaeology within the wider field of anthropological and archaeological research, and discussed the newest technical advances implementing a household archaeological framework. This meeting also provided a unique opportunity for engagement between junior and senior scholars who have been on the forefront of household archaeology in the Near East, Mediterranean basin, and South Asia for many years.

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[1] Some of many examples include: Bermann 1994; Ciolek–Torrello 1986; Flannery and Marcus 2005; Hastorf and D'Altroy 2001; Janusek 2004; Manzanilla and Barba 1990; Robin 2003; Sobel et al. 2006; Stanley and Hirth 1993; Tringham and Krstić 1990; Tringham et al. 1985; Wendt 2005; Ashmore and Wilk 1988.

The conference was held over the course of three days at the University of Utah in Salt Lake City. In accord with its title, "Household Archaeology in the Middle East and Beyond: Theory, Method, and Practice," the meeting was divided into three major sessions that advanced the theoretical foundations of household archaeology, considered new or developing methodologies for studying the household archaeologically, or presented the results of fieldwork focused on ancient households. Not surprisingly, many of the papers overlapped with multiple session themes. Thus, the chapters in this volume have been reorganized from the original presentation schedule into subject groupings, with the result, we hope, of being more useful to the reader. Beyond the plenary sessions, participants were treated on two separate evenings to enlightening talks by keynote speaker Ruth Tringham on her personal journey through the practice of household archaeology (Chapter 3) and J. Mark Kenoyer on the most recent work with households and neighborhoods from the Indus civilizations (Chapter 14). In addition, large quantities of coffee, food, and stimulating conversion were enjoyed by all during the many session breaks, lunches, dinners, and the conference banquet. A formal roundtable was graciously organized by Roger Matthews to provide a final venue for discussion at the close of the conference (Chapter 20). During this final session, many issues were expansively discussed, including the intersection of theory and data, consistency of approach, and the next phases in the development of household archaeology. The incorporation of recombinant narratives and the use of imagination to move from studying activities to interpreting behaviors were two of the most highly contentious debates.

Despite a variety of opinions from conference participants about definitions and approaches to household archaeology that have naturally materialized in this volume, two general concepts were generally embraced by all. First, participants agreed that households, however they are composed, are the basic socioeconomic unit of societies. Households are the dynamic loci of repetitive actions where personal identities and economic, social, and ideological interests of family or co-habitant groups intersect with and shape the trajectory of communities. Domestic material culture patterns are also produced through, and are therefore a reflection of, dialectic interactions between local groups and larger regional processes. By tracking and comparing domestic assemblages, such as discrete patterns of ceramics, flora, fauna, tools, and architectural elements, archaeologists can discern how households harness or diffuse opportunities for distinction and social differentiation within a community based on changes in modes of production, access to resources, and patterns of consumption visible in the material record.

Second, participants also agreed that the concepts of *households* and *houses* are distinct despite the occurrence of households inhabiting structures frequently referred to as "houses" (see especially Chesson, Rainville, and Rosen in this volume). A house is a physical structure that can serve myriad functions, including basic shelter, location of daily activities, a boundary between public and private spheres of society, and focal point for family life (such as childrearing, education, and enculturation). Houses are not static entities but dynamic extensions of people that both serve as the primary socializing agent (in the Bourdieuan sense of *habitus*) and share similar cycles of birth, aging, and dying (Carsten and Hugh-Jones 1995: 39). Households, on the other hand, are an ethnographic phenomenon (Allison 1999: 2) embodying people, who live as distinct social units, and the relationships among and between such groups. These relationships are conceptualized through kinship, economy, ritual, or any other aspect of human engagement that ties these groups together. Because the concept of household is nuanced and often fluid, we have delegated responsibility to the individual authors to offer their own definitions and uses of the terms "house" and "household." This is in part to provide transparency to our archaeological endeavors but also to underscore the very dynamic character of ancient social groups and to highlight the reality that universal definitions of these terms are likely unachievable and perhaps even undesirable.[2] The level at which households are investigated was also determined by each author, resulting in multiscalar approaches to this entity's physical (individual households, house groups, neighborhoods) and conceptual (individual agents, collective or corporate groups) manifestations.

Building upon these two general concepts, the contributors to this volume address numerous theoretical and methodological issues in household archaeology. Their contributions, which represent substantially revised versions of papers presented in Salt Lake City, are grouped into five sections. Section 1 presents some of the theoretical debates currently driving research on ancient households. Though many field archaeologists still follow Wilk and Rathje's effort to isolate household activities pertaining to production, distribution, transmission, and reproduction, postprocessual theory now dares us to go beyond these functional categories to see, or even imagine, households as productive units responsible for the constant creation and recreation of societies. For example, Stella Souvatzi (Chapter 1) problematizes the study of ancient households by suggesting that they should be envisioned not as static entities but as dynamic processes within wider social environments. She argues that households are constructed by constantly shifting sets of relationships within and between household groups and likewise between these groups and the wider social contexts in which they are embedded. In her examination of the home-making process, Meredith Chesson (Chapter 2) argues that the concept of "home" allows scholars to apply a more social-oriented framework to archaeological practice by combining standard archaeological techniques with agency and landscape theory. Finally, having experienced firsthand the genesis and growth of household archaeology, Ruth Tringham (Chapter 3) narrates a personal account of her application of this approach at numerous points throughout her career. With this background, she goes on to describe the role digital technologies can play in the study, presentation, and even future interaction with ancient households in the present.

Section 2 focuses on recent methodological advances in household archaeology. In the last two decades, a number of scholars, many of whom are working in the Near East, have developed a battery of new techniques for studying the use of space within domestic and other contexts. These include microdebris or microrefuse analysis, microstratigraphy, soil chemistry characterization, and microfloral studies.

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[2] Indeed some have previously argued that the very term "household" is not useful (Wilk and Netting 1984) or that domestic groups in general are not productive units of analysis (Hammel 1984; Smith 1992; Wong 1984). The contributions in this volume stand in opposition to these arguments.

In spite of their promise, there has yet to be a comprehensive treatment of either the theoretical or the methodological foundations for these new techniques as they apply to Near Eastern contexts—a lacuna addressed by authors in this section. In particular, Isaac Ullah (Chapter 4) uses his microarchaeological study at the site of Tabaqat al-Buma in Jordan to plot the densities of microartifacts and ecofacts from floors within a Neolithic dwelling using open-source Geographic Information System (GIS) software. The result is an unusually detailed reconstruction of how ancient household members utilized space. Both this and the study by Lynn Rainville (Chapter 5) give detailed descriptions of the procedures used in microrefuse analysis that will likely prove useful to archaeologists attempting to implement microarchaeological studies at other sites. Instead of a Neolithic hamlet, however, Rainville focuses on an Assyrian city to discuss a number of practical and terminological issues pertinent to the advancement of microartifact analysis. From here, we turn to the truly microscopic in separate studies that utilize microflora and microstratigraphy. Performing phytolith analysis at three Natufian sites in the southern Levant, Arlene Rosen (Chapter 6) convincingly shows the great potential that microbotanical data has for identifying the remains of perishable materials. She also highlights the promise this type of analysis has for reconstructing ancient environments. Finally, Wendy Matthews (Chapter 7) approaches households in the Iranian Zagros through microstratigraphic sequences, detailing the potential of this technique to isolate specific "life histories" of both houses and households.

Section 3 discusses food, which is fast becoming a topic of great interest in many anthropological and archaeological circles. Though scholars of the ancient Near East have long been interested in subsistence patterns, most traditional studies embrace topics such as domestication and resource exploitation without considering the social aspects of procuring, producing, and eating food. The chapters in this section favor the latter approach, highlighting the sociocultural engagements people have with food both in its preparation and consumption. In their examination of household foodways at the Halafian site of Fıstıklı Höyük in Turkey, Marie Hopwood and Siddhartha Mitra (Chapter 8) analyze use-alteration and organic residues from coarse-ware ceramics to make inferences about changes in food preparation that played a dynamic role in community cohesion. Similarly, Philip Graham and Alexia Smith (Chapter 9) examine the social aspects of plant use to create a framework for investigating household agricultural practice at Kenan Tepe, Turkey. Chantel White and Nicholas Wolff (Chapter 10) take the analysis of archaeobotanical remains a step further by examining the socio-technical aspects of barley cultivation at the Jordanian site of el-Hemmeh during the Late Pre-Pottery Neolithic B. They argue that the annual activities associated with agricultural production provided opportunities for the communication, transmission, and reproduction of complex bodies of knowledge about the agricultural cycle. The final contribution in this section by Bradley Parker (Chapter 11) combines numerous datasets from an ʿUbaid Period household at Kenan Tepe to offer a unique view of domestic modes of subsistence and production. His study explores the interface between local and regional trends, framing this household within larger issues of subsistence strategies, social integration, and increasing social complexity.

The subject of urban households is undertaken by the authors in Section 4. The Near East is famous for its cities. In fact, beyond the advent of agriculture, the urban revolution is seen as one of the most important transitions in Mesopotamian history. The chapters in this section thus exhibit how social change associated with city life is well reflected by urban households. For example, Rana Özbal (Chapter 12) uses microarchaeological analysis and soil chemistry characterization to address both the problem of identifying households in the archaeological record and distinguish many aspects of daily life at Tell Kurdu in the Turkish Hatay. Similarly, Yoko Nishimura (Chapter 13) combines data from excavations and remote-sensing surveys to illuminate the lifeways not just of a few households but the majority of the inhabitants of Titriş Höyük, the site of an ancient third-millennium city. The *longue durée* of pre-urban and urban households is also considered in this section. J. Mark Kenoyer (Chapter 14) in particular explores long-term trends in the organization of households and neighborhoods in the Indus Tradition as more inhabitants of the region immigrated to cities. Sarit Paz (Chapter 15) also addresses the urbanization of household groups, in this case focusing on the Early Bronze at Tel Bet Yerah in the southern Levant. Instead of seeing patterns of urban living as an elaboration of earlier village-based life, Paz suggests that urbanism in fact created brand new lifeways that reoriented patterns of household subsistence and production.

Section Five presents a synthetic household approach that moves beyond specific datasets to connect micro-household histories with issues on a macro-scale. For example, Catherine Foster (Chapter 16) links changes in household production to interregional networks of exchange in fourth-millennium Mesopotamia through a close examination of Late Chalcolithic house lots at Kenan Tepe, Turkey. She considers the domestic economy both as a structuring agent for labor and a reflection of household decision-making. David Frankel and Jennifer Webb (Chapter 17) examine sequences of occupation spanning nearly 500 years at Early Bronze Age Marki in central Cyprus, during which time cycles of household growth, development, and decline are clearly discernible. Their detailed reconstruction of the history of this site promotes their analysis beyond simple description to an examination of social processes. Similarly, Jeffrey Chadwick and Aren Maeir (Chapter 18) link episodes of growth and destruction at the southern Levantine site of Tell es-Safi with references to Judean and Philistine sites mentioned in Assyrian annals. Finally, James Hardin (Chapter 19) concludes this section by successfully combining multifaceted evidence from a single household at Tell Halif, Israel. Hardin examines not only use of domestic space by the ancient inhabitants but also pinpoints the integration of this and presumably other households at Tell Halif into local and regional networks of sociocultural interaction. The volume concludes with an afterword by Roger Matthews, which includes his personal reflections on the Utah conference, the application of household archaeology for answering broad questions about our ancient human history, and the future of this approach within the discipline of archaeology.

The goal of this conference and resulting publication is to exhibit the breadth and depth of household archaeological studies currently being undertaken by archaeologists in the Near East and eastern Mediterranean. More than simply reflecting the "state of the field," the following chapters underscore the significant contributions scholars of the ancient Near East are making to advance the study of households and to apply this information to larger questions of sociocultural importance. The contributors also address and grapple with some of the questions posed by Richard Wilk some 20 years ago: what is a household? How does a household group handle its resources? How are household decisions made or authority realized (Wilk 1991: 10)? We believe that these questions still resonate today, as is evident in the following pages where the multifaceted aspects of households are questioned, investigated, and celebrated.

We stated at the beginning of this introduction that household archaeology is a diffuse subfield with no unified definitions, theoretical underpinnings, or methodological techniques. This may appear to some as a shortcoming on the part of archaeologists who undertake this avenue of research. However, we see this diversity as a reflection of the very essence of houses and households as dynamic, fluid, and adaptable entities. In a way, the skirting of canonization in household archaeology assures that household studies will always be on the cutting edge of archaeological research, constantly evolving to explore more refined and deeper questions about life in the ancient and historic past. It is our hope that this volume and the important contributions it contains reflect the current progressive state of household archaeology, while looking to its future development and wider application in Near Eastern archaeology and beyond.

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Section 1

Household in Theoretical Perspective

Between the Individual and the Collective:

Household as a Social Process in Neolithic Greece

Stella Souvatzi

This essay aims to shift scholarly perceptions of the household. Instead of viewing the household as an adaptation to external forces or wider social structures, I advocate a view of the household as a process that constructs and reconstructs the wider social environment. I see the household as a producer of change rather than merely a respondent to it. Like any other social institution, the household does not exist outside society or history. Indeed, households are in a constant state of transition and it is in the continually shifting relationships within and between households that wider societal changes can be best understood. The central theoretical argument of this essay is that if we wish to problematize the social practices of the household, it is essential to consider both the interplay between the macro- and micro-levels of analysis and the dialectics between a range of sets of relationships. Social trends, norms, and relationships can be contested or inverted within the household, and thus the developments and transformations at the household level and those in wider social contexts must be examined simultaneously. To do so, this chapter understands both the household and the wider society as fluid, shifting sets of relationships that constantly validate and transform each other. It focuses specifically on the tensions or contradictions between household and community social reproductive strategies, which are variously manifest in Neolithic Greece. I begin by addressing some crucial questions of theory and approach raised during the conference that is the subject of this volume. I pay special attention to two specific theoretical issues, which, in my view, pose serious obstacles to an understanding of the household as a process. One is the stylized and thoroughly static image of the household in many archaeological studies. The other is the notion of a single-directed and uniform change from "simple" to "complex" societies and by extension from simple to complex household organization. I then proceed to an investigation of the material means and practices through which social identities and reproductive strategies were continually (re)produced in houses and settlements in Neolithic Greece, including architecture, material products, rituals, and burials. What I am especially interested to show is that the meaning ascribed to things and practices change at different scales of space and time and, perhaps more importantly, that things and practices can contain double meanings of both household differentiation and community identification.

Questions of Theory and Approach

A number of crucial questions concerning the present and future of household research were raised at the conference round-table. These include: What is the current state of archaeological household research and what should its future development and wider application be? Is it a distinct subfield, firmly embedded within the broader discipline of archaeology, or is it a marginal study not central to archaeological practice? Can household research address the "big" questions or illuminate the "big" pictures of the past?

My most inclusive response to these questions is that understanding households is important for archaeology for many reasons—historical, sociological, and intellectual—and that an archaeological approach to households is particularly crucial to an interpretive theory of social organization. As central and enduring social units, households have material components that connect them to key social phenomena and that can be traced over the remarkable scales of time and space available to archaeology. It is precisely the materiality, spatiality, temporality, historicity, and specificity of households that make them particularly appropriate analytical units for archaeologists. In fact, archaeology can expand considerably the knowledge of the diversity and multidimensionality of social units and can thus add a historical perspective to wider societal transformations. However, in order to do so, it is essential to rethink the relevance of inherited models, to explore ways of approaching households as active and dynamic social entities, and to engage in more systematic theoretical self-reflection.

While there is no doubt that "household archaeology" has contributed considerably to the understanding and systematization of the analytical utility of the household in archaeology, it has rarely overcome its original functionalist and processualist orientation (e.g., Byrd 1994, 2000, 2005; Coupland and Banning 1996; Cutting 2005, 2006; Haines et al. 2004; Hole 2000; MacEachern et al. 1989; Santley and Hirth 1993; Wilk and Ashmore 1988; Wilk and Rathje 1982). Households are often viewed through top-down perspectives as passive responses to wider longer-term social changes rather than the loci of small-scale social action that embodies the complexity and dynamics of everyday life. At the same time, many archaeological debates have moved beyond the household and toward other analytical scales—for example, of the individual or the person on the one hand, or of community or society, on the other (e.g., Canuto and Yaeger 2000; Chapman and Gaydarska 2007; Fowler 2004; Hofmann and Bickle 2009; Jones 2005).[1] In addition, a variety of interrelated social constructs (e.g., identities, gender, position, boundaries, memory, negotiation, knowledge, experience) are increasingly deployed in order to produce theories about social relations, categories, and practices from the archaeological data (e.g., Brumfiel and Robin 2008; Crown 2000; Grove and Joyce 1999; Hendon 1997, 1999, 2000; 2007; Hodder 2006; Hodder and Cessford 2004; Joyce 2000; 2007; Manzanilla 2004; Meskell and Preucel 2007).

This brings us to the question of the integration and/or the alignment of approaches and interpretation. The household exists in archaeology through a collection of theories, research frameworks, terms, and methods and through a growing number of works on individuals, houses, and communities. Two consequences of this are that many studies work at cross-purposes and that the examination of households has yet to be fully included in archaeology's theoretical and interpretive practice. In addition, the extent to which the chosen concepts and theories meet the specific research purposes is often questionable. We often perceive questions of methodology as theoretical and consider answers concerning the household as self-evident. We often question whether our data are appropriate for a "proper" household analysis, but we rarely question the validity of our models.

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[1] See also Dobres and Robb 2000 for individual agency and critical discussion in David 2001.

A serious obstacle to viewing the household as a process is our tendency to contemplate a stylized view of the household that is thoroughly static. In many prehistoric studies, the prevailing image has been of a stable household, firmly rooted in architecture (the "house"), land, and material possessions and developing, as a result, increasingly static and inflexible social relationships centered on a concern for greater autonomy and productivity (e.g., Bailey 2000: 269–70; Byrd 1994: 641, 643; 2000: 85, 91). Studies that privilege continuity in social reproduction and the construction of social memory also often place too much emphasis on stability (e.g., Bailey 1999; J. Chapman 1994; Hodder 2005, 2006; Hodder and Cessford 2004; Kotsakis 1999; Kuijt 2001; see also discussion in Tringham 2000). It can also be argued that research has dealt with social reproduction almost exclusively in the longer term and the larger scale, focusing on resource manipulation and "banking" and a need for intensification of production (e.g., Byrd 1994; 2000; Halstead 1989; 1999). It is perhaps images such as this that have strengthened our stereotype of the *a*-historic household and have engendered a reluctance to move beyond generalizing, all-encompassing models.

Although social reproduction is shaped by broad social structures and long-term historical processes, it could never be accomplished without small-scale agency. Households are the most important mechanisms of social reproduction, since it is there that the socialization of household members into particular rules, constraints, and dispositions is accomplished. Household agency also actively affects wider social structures through changing social relationships and variations in the degrees of integration within that wider structure. Similarly, households may place more emphasis on material and social interaction in the present than on establishing continuity of tradition and links with the past. In all, far from being static and stable, the household is fundamentally unstable and subject to continual fission.

Another serious theoretical problem is the idea that societies change from "simple" to "complex." This idea involves the emergence of specialization and hierarchy and represents the culmination of ordered progress and the apex of societal achievement. For example, the dominant ideology on Neolithic social evolution tends to see things in terms of a contrast between two main stages: earlier and later Neolithic. Earlier Neolithic is seen as relatively simple and the repository of real family and communal values; later Neolithic is seen as more complex, characterized by a new sense of household autonomy, the emergence of the individual and the erosion of collective ideals (e.g., Byrd 2000; Earle 2004; Flannery 2002; Halstead 1995, 1999; Hodder 1998; Johnson and Earle 2000). There are many limitations in using these ideas of "progress," which are deeply embedded in social evolutionism, to develop a comprehensive archaeology of the household.[2] One limitation is the assumption of a teleological and single-directed view of change and the disregard of historical context. Another is the compression of the bewildering and contradictory complexity of everyday life into a few general arguments. A third is that these ideas effectively deny complexity to households of a variety of societies in which clear-cut and permanent hierarchical relationships are lacking. Yet, households in any society by definition incorporate complexity, an important part of which lies in their interaction with the continually changing social contexts and material conditions within which they exist. In using a single-dimensional framework, it is also hard to imagine households as a way in which people have integrated and differentiated themselves socially. Rather, in order to reconstruct social trajectories, we need to look into the many practices that take place in a given historical context—local, regional, temporal, spatial, social, or cultural—as well as to account for cases of discontinuity and devolution.

A preliminary task of setting some conceptual boundaries around the household is necessary before one can thoroughly address wider social relationships or systematically look for potential fields of conflict and change between households or between household and community. A concern with definitions is also fundamental to an understanding of the household as a social process that integrates complex, and often contradictory, practices (e.g., altruism and antagonism), as well as to distinguishing between different concepts (e.g., household, co-residence, house, domestic group, kinship unit, and so on).

My definition and approach derive from various approaches in the social sciences (e.g., Hart 1992; Roberts 1991; Wilk 1991; Wilk and Netting 1984). The household is a social group cooperating in a sphere of social, economic, and ideological practices consisting minimally of production, distribution/consumption, transmission, and social reproduction. This concept of "household" is broader than just a collection of relatives and/or of individuals living together and sharing meals, whereas physical (spatial) boundaries around the household are fluid rather than stable. It moves away from formalism and pre-given definitions and toward a focus on the actions and interactions of people through household co-membership and cooperation in a set of practices. This is not to say that all households cross-culturally and diachronically perform the entire set of the above activities or that these cannot take place outside of the household. Instead, household activities represent analytical mechanisms that result in existing or changing boundaries rather than cross-cultural homogeneity of households themselves. Thus, the definition of household is not an end in itself; rather, it is the first step in research on household as a social process.

In my analytical work, in attempting to provide a social context for household, and despite the fact that the Greek Neolithic is rich in architectural data, I have chosen to designate household as a shifting location of action rather than resort to ready-made social and spatial forms (Souvatzi 2007b, 2008a, 2008b). One potential methodological problem with this definition may be that households, and particularly Neolithic households, are generally associated with self-sufficiency, and thus similar patterns and kinds of activities are expected to recur across a given site. Therefore, as a strong indication of an individual household, I considered the evidence for parallel occurrence of the aforementioned main activities or, in other words, the maximum definable number of socioeconomic and ritual activities in a certain space. Qualitative and quantitative analysis of a combination of intra-site evidence (context, architecture, material distributions, spatial associations, patterns of movement, specific clusterings of sets of items or features such as burials or specialized facilities) suggested that (a) co-occurrence of different activities was not universal at a site, (b) social entities can indeed be recognized on the basis of patterns of activities (e.g., residential/domestic or non-residential/communal), and (c) social entities were not necessarily circumscribed by the physical, architectural boundaries of buildings.

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[2] See Souvatzi 2007a, 2008a: 40–43, 205–7 for more detailed discussion and criticism; also R. Chapman 2003 and Kohring and Wynne-Jones 2007.

Overall, the view of household as an activity group enabled me (a) to combine all lines of available intra-site evidence, (b) to consider all patterns and features that map household space, practices, and ideologies, and (c) to consider, however imperfectly, social entities and their processes rather than architectural entities and their formal properties or material concentrations.

A final point concerns the terms used in the following sections. I use *household* to refer to the social entities identified according to the parameters/indicators outlined above, whereas *house* refers to a physical entity, a domestic building equivalent to the notion of residence or dwelling (cf. Ashmore and Wilk 1988: 6) and not to a household. A household as a social unit can, of course, be found to coincide with one house as a spatial unit, but I believe that this coincidence should not be starting point of analysis; a household can just as well be dispersed among a number of dwellings, while several households can share a single dwelling.

Neolithic Greece: A Complex and Diverse Cultural Context

The house and village community are of central importance in Neolithic Greece (ca. 6800–3300 B.C.E.; Table 1). In contrast to the hundreds of settlement sites, less than fifteen separate cemeteries have been identified to date, and no monumental architecture—ritual or funerary—is known outside the settlement (fig. 1). Houses and settlements are thus the key units of analysis in Neolithic Greece. However, this does not automatically imply that they also are the same all over Greece or that they remained unchanged through time. Instead, two key characteristics of Neolithic Greece are the complexity and diversity manifested in most types of the archaeological record, from settlement types and patterns to material culture—and from a very early stage. This section provides a framework for Neolithic Greece, directing attention to patterns of similarities and differences, to set in context the more specific examples of contradictions between household and community organization that will be presented in the following sections. I suggest that there are simultaneous levels of interaction and considerable variability in conjunction with uniformity and that households, rather than a single focus on the large scale, are the best way to examine and interpret these fluid processes.

For example, the settlements exhibit multiple principles of organization and different engagements with the physical and social landscape. They range from long-term restricted villages in the form of anthropogenic earth mounds (or "tells") with

Table 1. Chronology and phases for the Greek Neolithic and the sites mentioned in the text.

Period	*Date (CAL B.C.)*	*Sites*
Early Neolithic	6800/6500–5800	Nea Nikomedeia, Servia, Makrychori, Platia Magoula Zarkou, Sesklo, Franchthi Cave
Middle Neolithic	5800–5300	Makri, Servia, Sesklo
Late Neolithic	5300–4500	Makri, Dikili Tash, Sitagroi, Promachonas-Topolnitsa, Vassilika, Thermi, Stavroupolis, Makriyalos, Servia, Dispilio, Makrychori, Mandra, Platia Magoula Zarkou, Sesklo, Pefkakia, Dimini
Final Neolithic:	4500–3500	Dikili Tash, Sitagroi, Promachonas-Topolnitsa, Palioskala, Platia Magoula Zarkou, Sesklo, Pefkakia

closely-spaced houses and successive layers of habitation—such as Dimini, Sesklo (A), Pefkakia, Servia, Sitagroi, and Dikili Tash—to relatively short-term horizontally shifting sites with widespread buildings and extensive open spaces—such as Makriyalos, Thermi, and Stavroupolis (figs. 2 and 3). Short-lived hamlets also occur, as does occupation of caves (e.g., Franchthi), although less frequently, and lake and lakeside settlements such as Dispilio and Palioskala, respectively, add yet another dimension to the picture of diversity of settlement type and location.

In addition, various household forms and spatial arrangements can be identified. Sometimes coexisting at the same site, they range from a household occupying one house to a household occupying more than two physical structures and/or external areas. Architectural properties such as the size and form of houses do not appear to have played an important role in household spatial or social definition. Among well-preserved contexts, large houses can be single-roomed and can have only a few features, and smaller houses can be two-roomed or otherwise partitioned and can contain have a variety of features. For example, the 28 complete and partial Neolithic buildings at Servia were either square or rectangular and had one, two, or three rooms. Ground plans measured from 3.5 to 5.5 m in width and from 6 to 10 m in length; interior floors were made in three different techniques; and there were, in addition, several types of features, storage facilities, and cooking structures (Mould and Wardle 2000). At the settlement of Sesklo, rectangular free-standing houses coexisted with structural complexes of several rooms or houses (see below). At Dikili Tash in Macedonia, a large rectilinear building containing three autonomous rooms of equal size, almost identical spatial organization, and having the same range of material culture seems compatible with a picture of three different households sharing the same residence.

Another important characteristic of the Neolithic in Greece is the abundance and complexity of material culture, which suggest that craft specialization and long-distance exchange had been developed at a very early stage. For example, pottery is distinguished by high proportions of fine, decorated ware, thin and complicated shapes, and an overall emphasis on skilled manufacturing and elaboration (figs. 4 and 5). Chipped stone tools and *Spondylus* and other shell ornaments suggest that

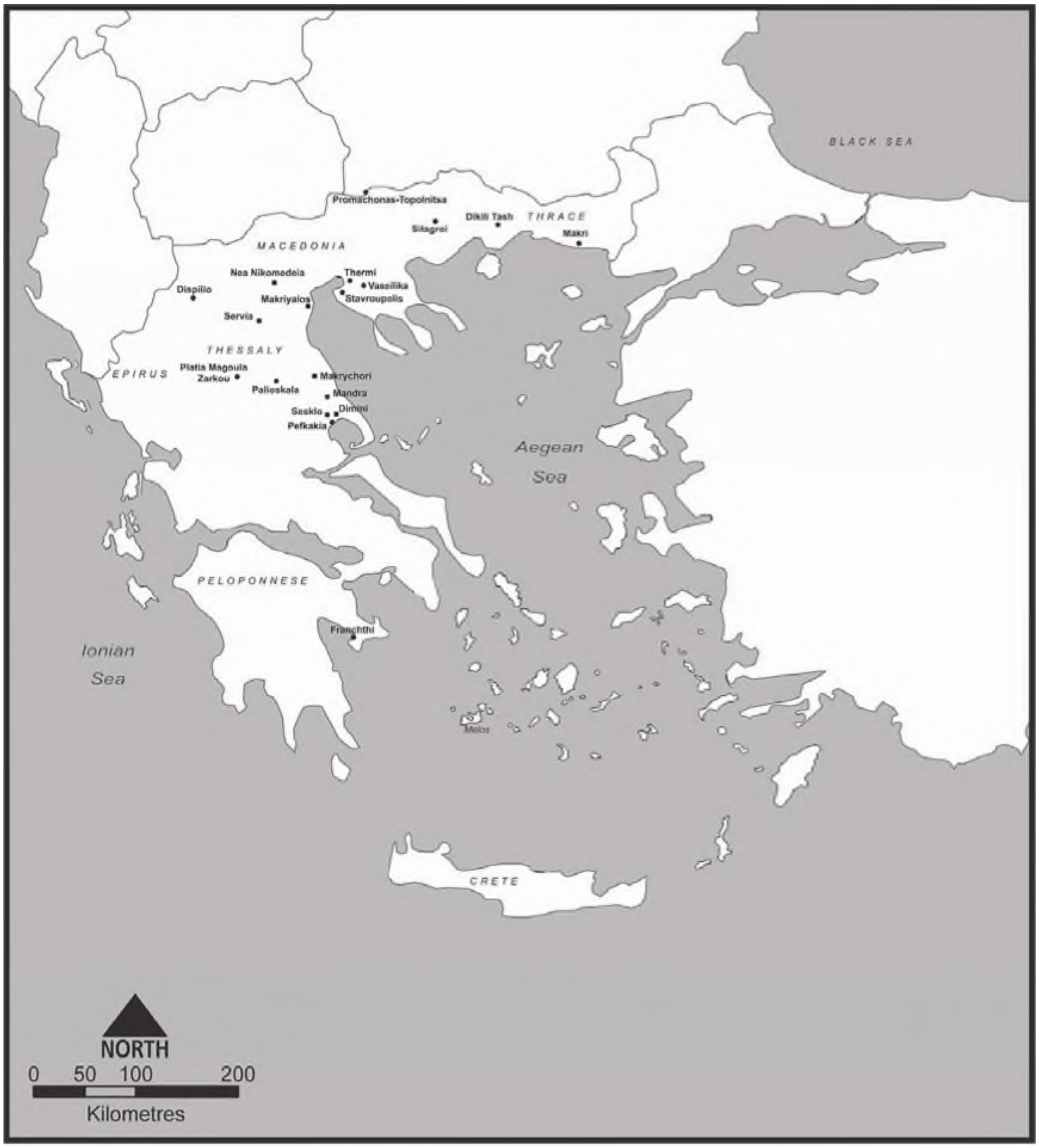

Fig. 1. Map of Neolithic sites in Greece mentioned in the text.

craft specialization was already well underway in the Early Neolithic. The chipped stone tools (blades, bladelets, sickles, and scrapers) were manufactured mostly of flint and obsidian, which come from the island of Melos (fig. 1) and involved seafaring at a time when this island was still uninhabited. The far-flung distribution as far as central Europe and the North Sea of *Spondylus gaederopus* items—bracelets, pendants, and beads—originating from the Aegean Sea also attests to an extensive intercultural network and to specialized production centers within Greece. These and other classes of material culture suggest the coexistence of multiple levels of technical efficiency

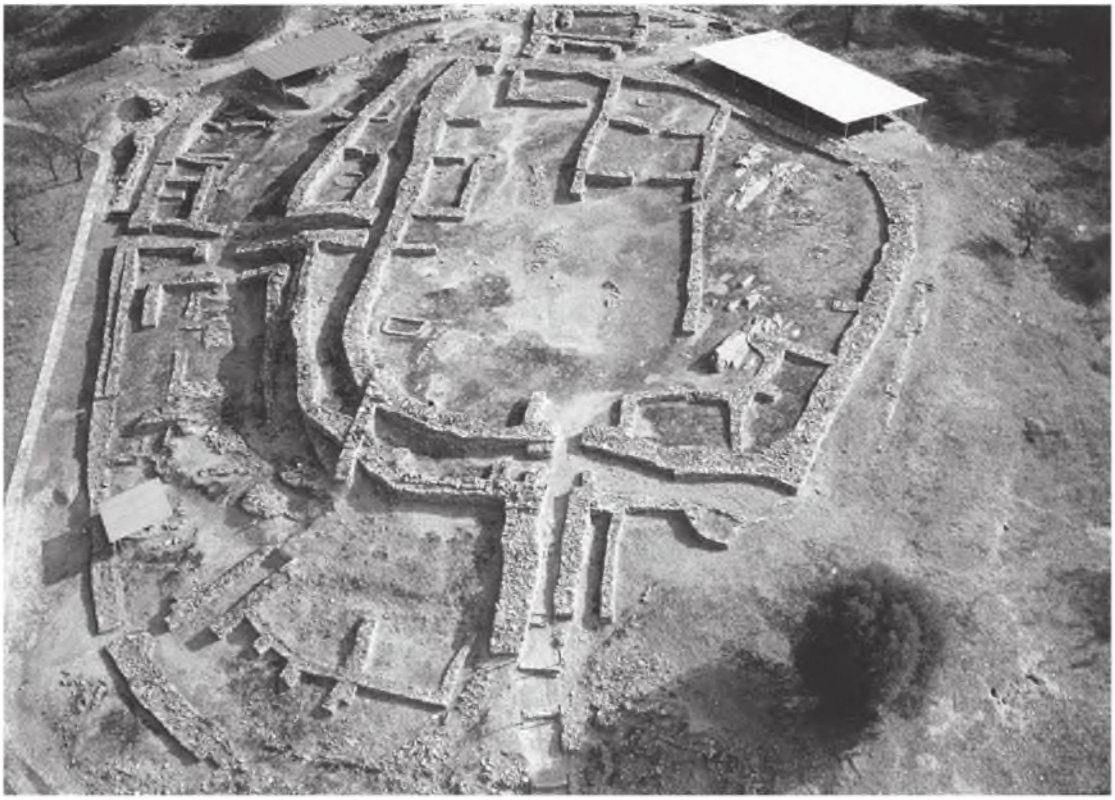

Fig. 2. The settlement of Dimini. The central part is 4–5 m higher than the bottom of the outermost enclosure. In the central enclosure, the addition of the front room of the double-roomed building and the blocking of the west and east radial entrances occurred at a later stage. In the southwest segment is a workshop area with pottery-firing facility under shelter and a circular stone platform across it. The southeast part outside the innermost enclosure (bottom and center right) is unexcavated. (Reproduced courtesy of Vassiliki Adrimi-Sismani.)

and different modes of production and exchange (Karimali 2005; Perlès 1992, 2001: 201–10; and Skourtopoulou 1998, 2006 for lithics; Chapman et al. 2011; Miller 2003; Nikolaidou 2003; and Renfrew 1973 for shells).

A third and equally interesting characteristic of the Greek Neolithic is that the data reveal regionally distinct local trajectories that resist being enclosed within one uniform temporal sequence. For example, the absence of Early Neolithic sites in central and eastern Macedonia cannot be satisfactorily accounted for by economic factors, environmental conditions, or temporal trends (see discussion in Andreou et al. 2001: 318–19). As mentioned above, the Aegean islands were not systematically inhabited until the later phases of the Neolithic, and in southern mainland Greece, the Final Neolithic is also a period of territorial expansion that has been linked to a general shift to Aegean trade and metalworking (Davis 2001: 24). By contrast, in Thessaly, the long, stable, and dense settlement pattern broke in the Final Neolithic, when a dramatic reduction in the number of sites took place (Johnson and Perlès 2004). The development of material culture did not follow a typical evolutionary trajectory, either. Toward the end of the Neolithic, ceramic production deteriorated

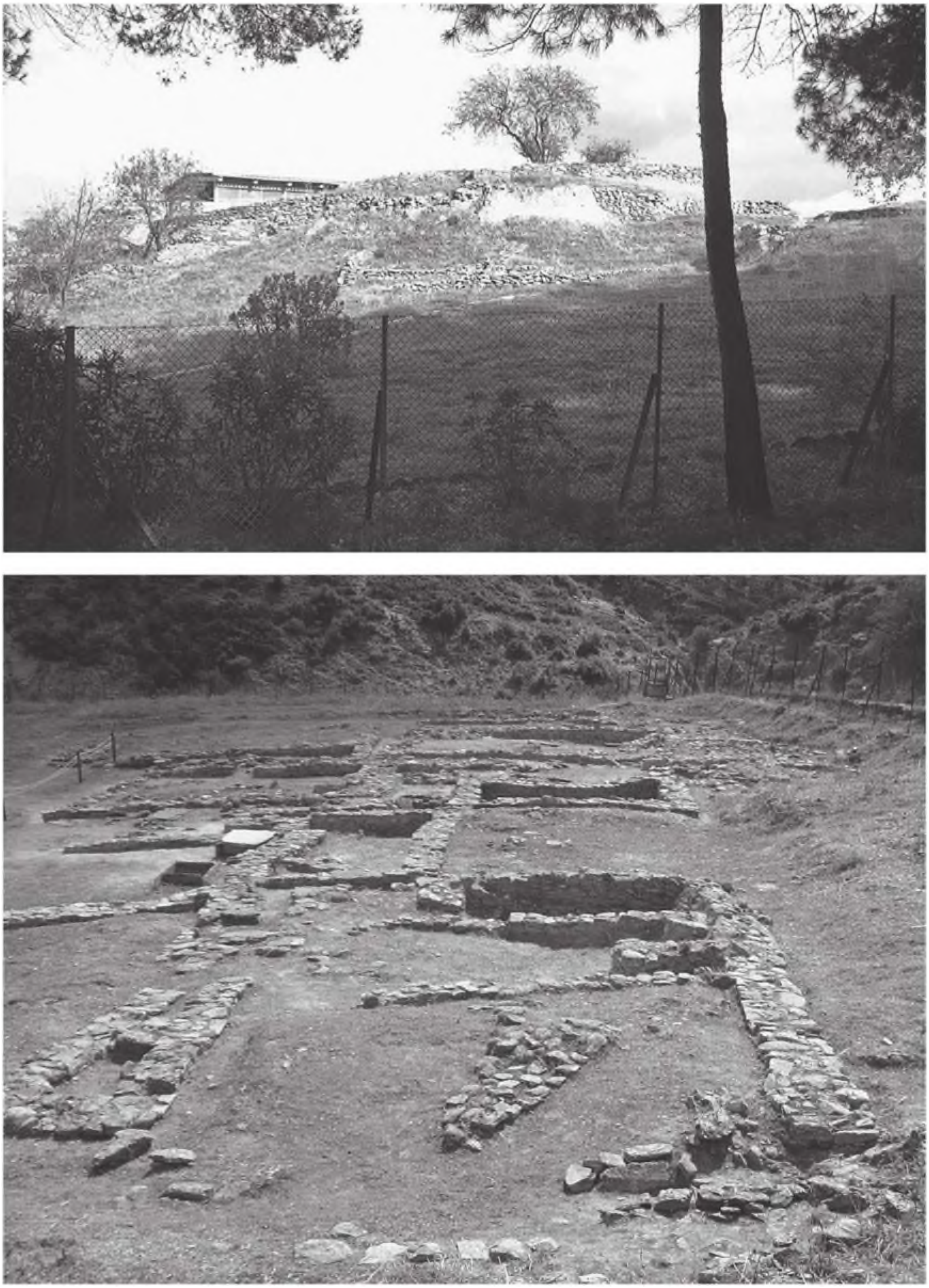

Fig. 3. The settlement of Sesklo. Top: view of the tell (Sesklo A), showing retaining wall. Bottom: view of the more extended part of the site, spread below the tell (Sesklo B); in the middle: buildings Z2, Γ, and A (see also fig. 7.).

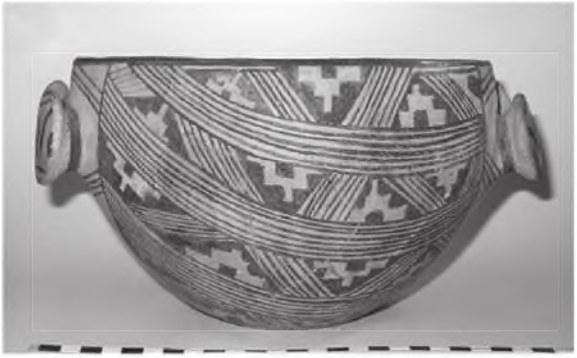

Fig. 4. Painted deep bowl (Brown-on-Buff) from Dimini with double handles bearing painted human or animal faces.

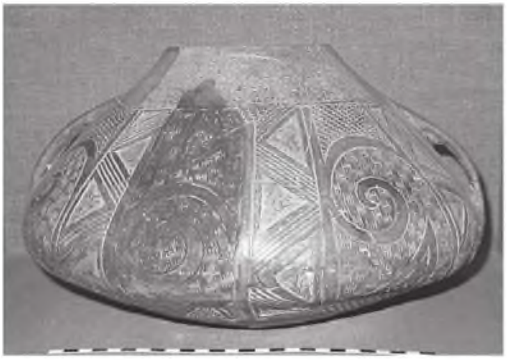

Fig. 5. Incised globular jar from Dimini with dense and highly structured geometrical decoration.

in quality, and it may be that for the first time in the Greek Neolithic "we are seeing something close to household production for household consumption" (Vitelli 1995: 58; contra: Kalogirou 1997: 15; see also Mee 2007). The evidence for chipped stone production in the Final Neolithic also points to a process from specialization to "de-specialization" (Perlès 1992; Perlès and Vitelli 1999). Similarly, by the following temporal period, the Early Bronze Age, *Spondylus* shell production had almost completely disappeared.

Significantly, different settlement and house types are developed within the same region, and new surveys have shown that soil formations do not seem to have played a decisive role in settlement location (e.g., Gallis 1992; Johnson and Perlès 2004). Technological and economic developments such as craft specialization, long-distance exchange, subsistence surplus, and settlement agglomeration, which are considered to be key innovations toward structural transformations, did not instigate any radical or long-lasting changes in the social organization of Neolithic communities. Besides, many of these are far earlier than the Late Neolithic, no matter how hard we may attempt to force the data to fit into an earlier/later Neolithic contrast.

Given the relatively small geographical area of Greece, all these phenomena make Greece's Neolithic all the more intriguing and have a number of implications that are of particular relevance here. Perhaps the most significant implication is that the data indicate an interplay between uniformity and variability (Souvatzi 2008b), suggesting that wider organizational principles may have been realized differently at a local level. On the bigger picture, there is an overall sense of uniformity in the material culture and in ways of life. Although material culture traits show regional and temporal variations, it also shares key elements, including ceramic decoration and tool and ornament technology, which linked sites through shared systems of signification, through particular specializations and through exchange of ideas and objects. Cultural uniformity was partly maintained through settlement patterns, through a shared concern for the creation of a structured settlement space, including enclosures and ditches that surrounded the settlements (figs. 2 and 3, 6; discussed in the next section), and through similar contextual associations of people, buildings and material. At the same time, in the smaller picture, the multiple principles of settlement and household organization and the different modes of production, distribution, and exchange of different goods, such as pottery, lithics, and ornaments, reflect considerable variation in the organization of economy, in notions of permanence and continuity, in how social groups defined themselves, and in how communities may or may not be interconnected.

In order to understand these phenomena, we ought to search for less gradualist and more fluid and discontinued models for interpretation and to look for evidence inside a social system rather than outside of it. It is also crucial to recognize and interpret difference and to consider the dialectic between stability and variability. From every point of view, it is essential to address questions at the household level. What are the purposes of diversity and homogeneity in the ways and degrees in which households interact with other social institutions and with the broader society? Was the household the only key unit in social structuring or were there other shared social and ideological structures? And how were these shaped, negotiated, or contested within the household?

Contradictions: Differentiation and Unification

This section looks deeper into the Greek Neolithic communities, embracing a view of households as composed of fluid relationships that are constantly being forged, broken, and remade in a process of social (re)production. As Joyce and Grove (1999: 4) have stated with reference to the Preclassic Mesoamerican context, "the small-scale setting of domestic life is the pre-existing context for the beginnings of all transformations that occur." I suggest that a developing contradiction between community and household organization, located particularly in the realm of conflicting strategies of social reproduction, might be a cause of internal tension and transformation within a social system. In this section, I explore some of the many ways in which a society attempts to integrate differentiated identities and interests into a cohesive whole and which households can resist or even appropriate in order to promote their own interests and identities, drawing on four lines of evidence: (a) architecture, (b) craft production, (c) ritual practice, and (d) intra-settlement burials.

Architecture, Settlement Organization, and the Multiple Scales of External and Internal Variation

One contradiction relates to the multiple scales of architectural variation within settlements and particularly to a contrast between settlement uniformity and house/household variability. On the one hand, despite the differences in inter-settlement organization outlined above, settlements still hold many architectural and organizational elements in common. These include the ordered layouts of settlements, the common orientation of buildings within each settlement, the common construction techniques and materials for domestic and public architecture and an overall emphasis on large-scale labor-intensive architectural works such as multiple stone enclosures and ditches (figs. 2 and 3, 6). Indeed, Greek Neolithic settlements represent a great deal of effort and concern for the creation of a structured environment, where technical skills coexisted with social organizational principles (Souvatzi and Skafida 2003). For example, at Dimini, six stone concentric walls that follow the natural

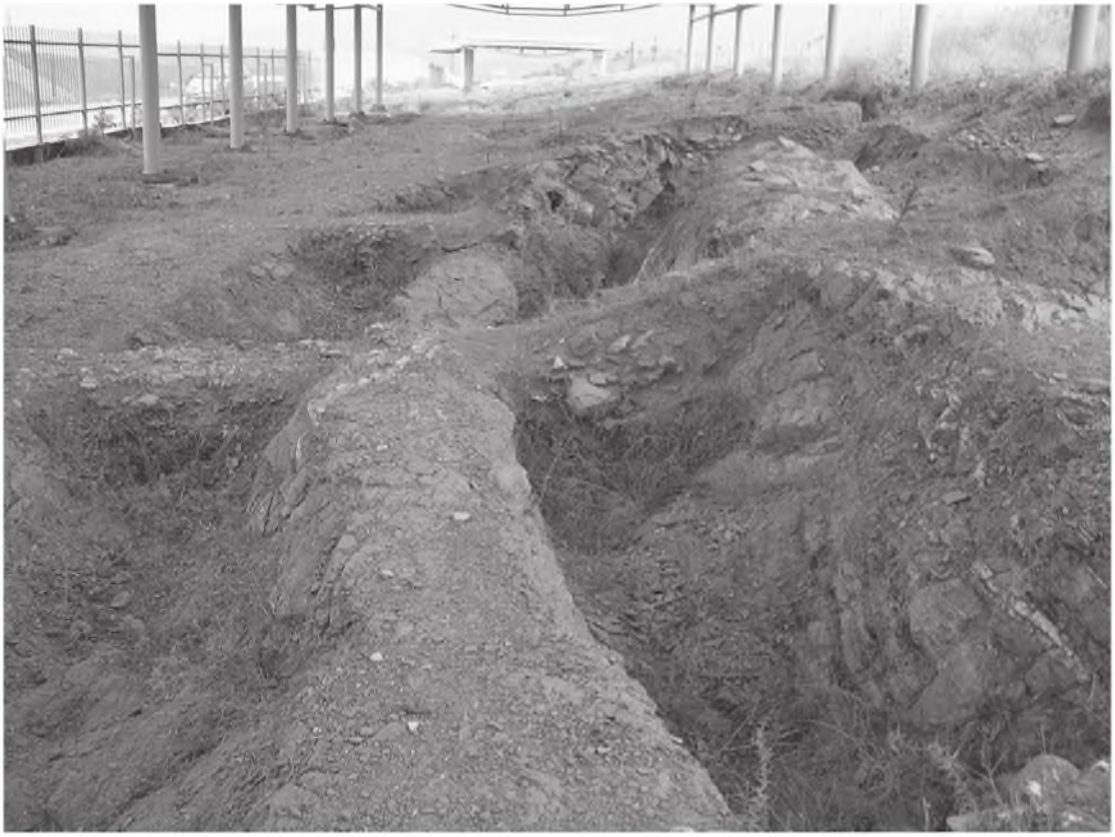

Fig. 6. Concentric stone-cut ditches at Makrychori I.

contour of the mound define several habitation terraces surrounding a central courtyard (fig. 2). At Palioskala, the number of stone enclosures seems disproportionately large compared to that of the structures within, which were, unlike those at Dimini, limited to the central parts of the mound (Toufexis 2006). At Makriyalos I, two large concentric ditches, traced for a total of 470 m, surrounded an area estimated at 28 hectares (Pappa and Besios 1999). The inner and larger ditch was up to 3.5 m deep and up to 4.5 n wide. At Makrychori, three concentric ditches were cut into the solid rock (fig. 6; Toufexis 2008).

This uniformity suggests the use of architecture for the mediation of communally accepted principles of identity and order. It must have involved collective labor, planning, and decision-making, all of which imply organization at the community, rather than the household, level. It thus created a sense of wider social standards, connected different households within a settlement into a larger collective unit, and provided a mechanism for enhancing social interaction.

On the other hand, underneath this uniformity exists a remarkable lack of standardization inside buildings within a settlement, which suggests that individual households were also personal products. For example, there is considerable intra-site variation in the location, number, and type of structural features, including floor types, internal divisions, and entrance location. Furthermore, there is nothing to suggest that households within a community remained stable or that they retained the same organization over time. Instead, there is evidence of constant alterations of flooring and construction techniques and the arrangement of structural elements in the different building phases. These characteristics are best exemplified at Middle Neolithic Sesklo (5800–5300 B.C.E.). The site is comprised of a tell and a more extended settlement spread below, named Sesklo A and Sesklo B, respectively (fig. 3; Theocharis 1973). Sesklo A is distinguished by long and successive sequences of free-standing and vertically superimposed buildings. At Sesklo B, deposits are thinner and sometimes discontinuous, houses were less long-lived, and they were often clustered in complexes. In spite of the differences in habitation pattern (see Kotsakis 1994, 1999 for a detailed discussion), there are many architectural and organizational elements held in common between the two parts of the settlement, including the same energetic and symbolic investment in high-quality architecture, house shape and orientation, and the design principles of symmetry and geometric order inside houses and in open spaces (see Souvatzi 2008a: 81–91 for more details).

It would then appear that the Sesklo houses were stable and complied with the wider social norm, as expressed by the relative standardization and regularity in architecture. However, this regularity and the general rules of space segmentation are remarkably contrasted with the constant rearrangements of house interiors and patterns of movement over time (fig. 7). The process of structuring and restructuring house space seems to have been incessant, even though it rarely resulted in a deviation from the original, wider conventions of plan and size of houses. It included creating different types of floors, introducing new facilities and blocking or relocating entrances. In addition, space divisions alternated within the same house between buttresses, partition walls, and floor type combinations, new rooms were introduced onto or next to older ones, and features and associated material kept changing location, shifting from one section of the house to another and then back to the previous location again.

The reorganization of internal areas can imply a reconsideration of social relations, tensions, and disagreements arising, for example, over rights to property and inheritance, the fusion of new members, the negotiation of age and gender roles, relationships with neighbors, and the repeated redistribution of goods, labor and resources. A degree of instability at the household level must have also been produced by numerous other reasons. For example, to ensure the reproductive viability of local populations through "marriage" patterns, to work elsewhere and to exchange labor, goods, and visits.[3] The early development of long-distance communication and exchange also suggests constant mobility of people and things. For instance, Chapman and Gaydarska (2006: 170–71) estimate that, for every *Spondylus* shell ring that traveled from northern Greece to the shores of the Black Sea, at least three different specialists were required, in addition to a long voyage and stay away "from home and hearth." Similarly, Perlès' (1992, 2001: 207–8) model of "itinerant knappers" of obsidian from Melos implies mobile and seafaring specialized workers and traders activated at local, regional, and interregional scales.

Overall, this mobility lies between the relative stability of the community and the contingency of the individual household. If the wider social structure represents the promotion of collective standards, then the households promoted their own in-

[3] See also Halstead 2005 for subsistence failure and seasonality of consumption.

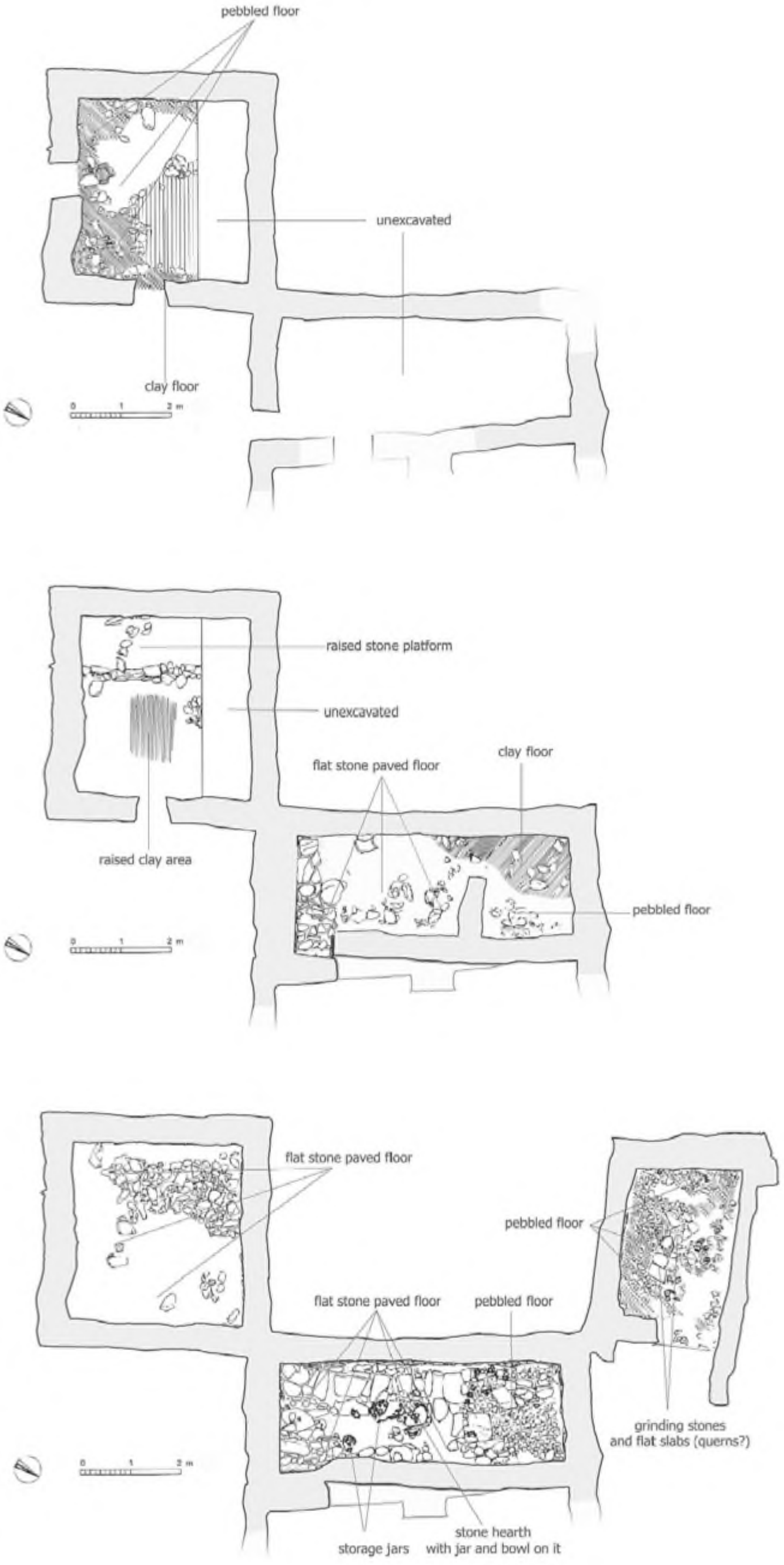

Fig. 7. Occupation phases of buildings A, Γ, and Z2 at Sesklo, showing the changes in floors and internal organization through time. Upper: first phase; middle: second phase; lower: fourth phase. (Plan redrawn from Kotsakis 1981).

dividual choices and identities, which would have partly counteracted wider social standards. In this way, every household was in a constant state of transition, creating the seeds of its own transformation as well as the seeds of contestation of the wider social structure.

Production and Distribution of Craft-Specialized Products

Another possible tension is represented by a contrast between the production and the distribution of craft-specialized products. As noted earlier, the Greek Neolithic material culture indicates the early development of craft specialization in and long-distance exchange of several material classes—including decorated pottery, shell and stone ornaments, and obsidian tools. Craft specialization and long-distance exchange suggest that some individuals or groups were involved in activities in which others were not. They entail social division of labor and differential access to production processes and possibly also to long-distance exchange networks and creates the potential for economic and social differences between households. The presence of spatially restricted workshops or production areas within settlements further increased this potential. Examples include a specialist workshop of incised pottery and *Spondylus* beads at Dimini (see below); the specialized stone axe and bead workshop at Makri (Efstratiou and Dinou 2004); the extensive pebbled yards at Thermi, Vassilika, and Stavroupolis, with their flint-knapping and crop-processing waste (Skourtopoulou 2004); the pottery-firing facility at Dikili Tash, associated with burned vessels and an abundance of tools (Treuil 1992); two pit complexes with knapped stone tools and production debris from high-quality materials at Makriyalos (Skourtopoulou 2006: 66); and the specialized workshop of cockle-shell beads at Franchthi (Perlès 2001: 223–226).

Interestingly, however, when it comes to distribution and consumption, the households within a settlement seem to contain homogeneous assemblages of material culture—in fairly stable proportions. In other words, the limited participation in the production of specialized goods is contrasted with an unlimited intra-site distribution and consumption of these goods. This means that although an unequal distribution of certain goods among sites (Perlès and Vitelli 1999: 99) may be true, given the differences in distribution of basic resources within and between regions, the same does not apply within sites. Even though limited as yet because of the relative lack of concern with extensive excavations and horizontal material distributions in Greek Neolithic research until recently, the evidence is suggestive: at all of the sites at which such questions have been addressed, consistent indications of unequal distribution of a kind that would point to social differentiation are lacking.

The even distribution of all types of material is best exemplified at Dimini, the very site that has been taken in the past to suggest the rise of economic elites during the Late Neolithic (Halstead 1995). Dimini yielded evidence for specialized production in pottery, obsidian tools, and *Spondylus* ornaments, as well as for at least one specialist workshop (fig. 2). This workshop contained a pottery-firing facility, a round stone platform, a concentration of incised pottery and *Spondylus* beads, and an abundance of tools of all kinds. Moreover, Dimini enjoyed a prominent position in exchange networks. For example, the distinctive pottery style known as Dimini Ware (fig. 4) was very influential and widely imitated all over Greece. Dimini is also thought to have been a main production center of *Spondylus* ornaments (Chapman et al. in press; Tsuneki 1989). Last, lithic studies suggest that obsidian cores from Melos were locally prepared at Dimini and then possibly distributed inland (Karimali 1994: 378–79; 2000). Within the settlement, however, the homogeneous distribution of craft-specialized and other products suggests that they acted as symbols of collective rather than individual identity or status. Equally, in Servia and in Dikili Tash, all houses appear to be similar in nature, containing a fair amount of features, facilities, and finds, despite variations in building techniques. At Stavroupolis, the spatial distribution of chipped stone tools is largely homogeneous across residential contexts and for both main phases of occupation, despite the variation in raw materials and technical strategies (Skourtopoulou 2004: 393–401).

In conclusion, households or individuals may have differed in economic roles and contributions to the wider economy, containing within themselves the means to create social distinctions and asymmetries through limiting participation in production, social division of labor, and variation in labor input in different processes at different times. However, the main patterns of distribution of the goods themselves and the ideological information on how to consume the products seem to have been defined by the community as whole.

Domestic Rituals and Public Rituals

The third example of a contradiction between household and community concerns domestic rituals and public rituals. Domestic rituals and symbolism were used to define households as individual groups and as ritual units. Community rituals, on the other hand, were normalizing and aimed to promote a dominant ethos of collectivity. A most interesting characteristic here is that the same or similar means and practices were used for both aims.

One means to emphasize metaphorically the social and ritual importance of the household is the production of house models and the link between domestic architecture and human and animal representation. A good testimony of this in Greece comes from Platia Magoula Zarkou in Thessaly (Gallis 1985). The interior of a house model found at the site contains a range of domestic facilities and eight human figures, identified as four children and two female and two male adults. It was found intact under the floor of a Late Neolithic house inside a pit under the hearth that was dug specially into the debris of the previous house floor. It probably reflects a foundation offering. Other such offerings include artifacts, child bones, or even animal bones found embedded under floors, walls, or permanent installations. There also are heads of animals—actual, clay, or covered with clay. At Dikili Tash, an actual bucranium, covered with raw clay, found fallen with its back up on the floor, was apparently originally attached to the interior wall of a house as relief decoration or a hunting trophy (Treuil and Darcque 1998; Treuil and Tsirtsoni 2000). Around it were preserved storage and cooking pots, domed ovens, clay platforms, and a wide range of material. As is known, bucrania occur over a very wide area, from southeast Europe to the Middle East. They frequently come from inside houses that also contain a wide range of everyday "utilitarian" artifacts, with classic examples coming from Çatalhöyük in Anatolia (Last 2006: 201–4; Mellaart 1967; Russell and Meece 2006) and from Vinča (Vasič 1936: 50–52) and Para (Lazarovici and Lazarovici 2003: 391–94) in southeast Europe. Returning to Greece, at Palioskala, three zoomorphic clay objects (probably animal heads, probably cattle) were found in the middle room

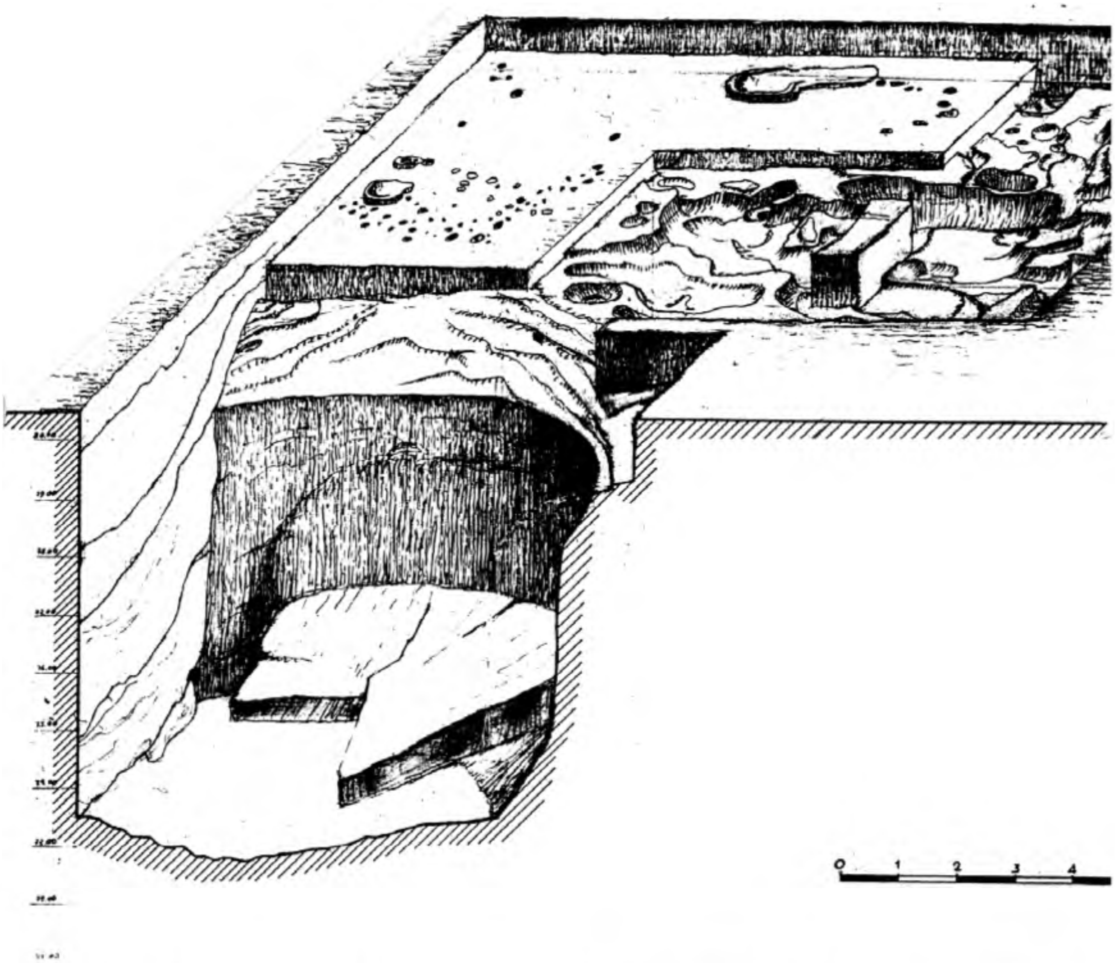

Fig. 8. Plan of the communal subterranean building at Promachonas-Topolnitsa, showing distinct differences in size and architecture from the semi-subterranean domestic buildings around it. (Reproduced courtesy of Chaido Koukouli-Chrysanthaki.)

of a tripartite building in a triangular arrangement. Their small size (14 to 15 cm high, 12 to 13 cm wide, 10 to 14 cm thick), flat bases, and partly hollow interiors suggest that they might have originally been fixed to structural elements of the buildings (e.g., the entrance, a wall, or a wooden post; Toufexis 2009). Last, several house models had bucrania sculptured in clay attached to their gabled roofs (e.g., Koukouli-Chrysanthaki et al. 2005: 100, fig. 30; Toufexis 2003: fig. 29.3).

However, the same material means and practices were also used for community ritual. A good example comes from a large circular subterranean building at Promachonas-Topolniča I (end of the sixth millennium B.C.E.; fig. 8). This building is clearly distinct from the small semi-subterranean domestic buildings of this phase. It was rebuilt at least two times, and there were many minor phases of maintenance and modification. Its exceptionally rich contents include more than 15 actual bucrania and several horns and skulls of other horned animals (rams and deer)—actual, clay, or modeled in raw clay; high assemblages of house models, serving pottery, figurines, tools, and ornaments; and fragments of clay with plastic decoration. The material had been deposited in thick successive layers or floors. Each floor had been burned and then abandoned for a time before it was replaced by another. The excavators believe that this building had a communal ritual function involving offerings and food consumption (Koukouli-Chrysanthaki et al. 2005: 101). I believe that it could equally represent a cycle of ritual and collective discard, if not also destruction by fire ("ritual killing?"), of individual material possessions by the entire community. This repeated process could indicate a social need to balance competing household interests and identities and to generate and regenerate a dominant ethos of equality. The burned floors and material inside the Promachonas-Topolniča building may attest a motive similar to that explored by Cessford and Near (2006) in their study of house-burning at Çatalhöyük. They point out that although fire destroys personal histories and memories, it also has transformative, purifying, and renewing properties and can thus create new, collective memories (see also Tringham 2005: 104–8).

There is also evidence for ritual feasting at the community level. At Makriyalos, in phase I (5200–4900 B.C.E.), inside an exceptionally large pit-feature (preserved to an area of 30 by 15 m) were deposited an unusually large volume of pottery and animal bones, together with grain crops, grinding stones, and fragments of cooking facilities (Halstead 2007; Pappa et al. 2004; Urem-Kotsou and Kotsakis 2007). Most of the finds formed a layer 10 cm thick at the base of the pit and seem to have accumulated over a short depositional episode (spanning from months to just a few years). It is argued (Pappa et al. 2004: 41) that the pit represents large-scale feasting and conspicuous consumption of domestic animals as a mechanism for strengthening relationships in a regional social network. In phase II of the same site (4900–4500 B.C.E.), the stratigraphy and contents of the large and deep Pit 24 suggest formalized large-scale ceremonies involving structured deposition of impressive amounts and kinds of material, deposited there after the end of the original use of the pit as a dwelling. They include high-quality blade tools, painted pottery of Dimini Ware, stone and clay figurines, clay stamps, ornaments, charcoal, and animal bones (Skourtopoulou 2006: 68–69, 72).

Overall, the deposition of large quantities of goods in collective contexts requires us to reconsider the earlier views of what rituals occurred and what functions they served in the local and regional social network. The rituals of the household metaphorically emphasized its social importance. At the same time, the community, using similar material means and practices, apparently aimed to subdue individual interests and identities in favor of the collective. One implication here is that rituals and symbolism were a means of promoting both definitions of house and identification and membership of community.

Intra-Settlement Burials

Intra-settlement burial practices are considerably diverse. They include both sexes and all age groups; they can be primary or secondary and single or multiple; and they range from complete pit-burials to bone fragments scattered in the settlement deposits and from single cremation in pots to skull ossuaries and funerary complexes (Souvatzi 2008a: 186–93). Yet, specific manipulations of bones and bodies and the ways that material symbolism was selected and displayed indicate that burial practices were not as random as they might at first appear. Depending on the treatment of the dead and the specific location of burial within a site, the most consistent pattern that can be detected is a distinction between children and adults, possibly corresponding to a difference between household and community social reproductive strategies.

One the one hand, there is an abundance of child burials or an overall visibility of children in more isolated burials within and around houses. They are primary and secondary and take place in floors, under hearths, in built-in facilities, in pots, or in pits. At Dimini, the presence of eight cremation infant burials inside buildings, some in pots made especially for this purpose, is contrasted with the absence of evidence for adult burial (Hourmouziadis 1978). Of interest also are two triple burials between houses at Nea Nikomedeia, one of three children and the other of a female holding two children (Rodden and Rodden 1964). Even in sites characterized by relatively uniform mortuary practices such as single pit-burials, children frequently seem to be more visible than or distinct from the adults by having been treated specially. They are often lined or covered with rocks, stone slabs, burnt or smashed painted pottery, thick layers of ash, and so on. Secondary child burials may point to rites of house abandonment or closure, because there is evidence that they were brought inside later instead of during the occupation of the house or the floor. For example, in a house at Dimini, a child skull and bones were found mixed with fallen superstructure material, implying deposition on the floor rather than interment in or under it (Souvatzi 2008a: 144–45).

Generally, the separation of children from the rest of the kin or domestic group can be seen as evidence for their special status and their intimate symbolic connection with the household.

On the other hand, there are burials not confined to an individual household but instead located in more remote parts of settlements or in perimetric ditches. These burials often contain adults and tend to be disarticulated or fragmented, though isolated, complete, and primary adult burials do occur. At Makriyalos I, the remains of at least 50 to 60 individuals, most of which were adults, were found mainly inside the large perimetric ditch (Triantaphyllou 1999). At Stavroupolis, at least 12 individuals are represented by more than 100 fragmented remains scattered in the settlement or simply thrown into shallow pits (fig. 9; Triantaphyllou 2002, 2004). At Mandra, there is a burial of an adult inside a large ditch that surrounded the settlement. The limbs of the deceased had been removed at some stage and were reburied in a small cavity on the side of the ditch dug specially for the purpose (Toufexis et al. 2009). An important characteristic of these types of burial is the difficulty to discern obvious or definite patterns of sex, age, body part representation, or degree of disarticulation. Rather, they seem to illustrate an association of bodies (and particularly of adults) with the village community as a whole rather than with individual people or households.

These patterns reveal a distinction between strategies of social reproduction at various societal levels. Specifically, the child burials within or near the spatial confines of houses may constitute part of individual household social reproductive strategies and memory construction. On the other hand, the burials in places not confined to an individual household, which more often than not belong to adults and tend to be fragmented, underline an association between a collectivity of the deceased and a collectivity of the living (Perlès 2001: 281). They might reflect a

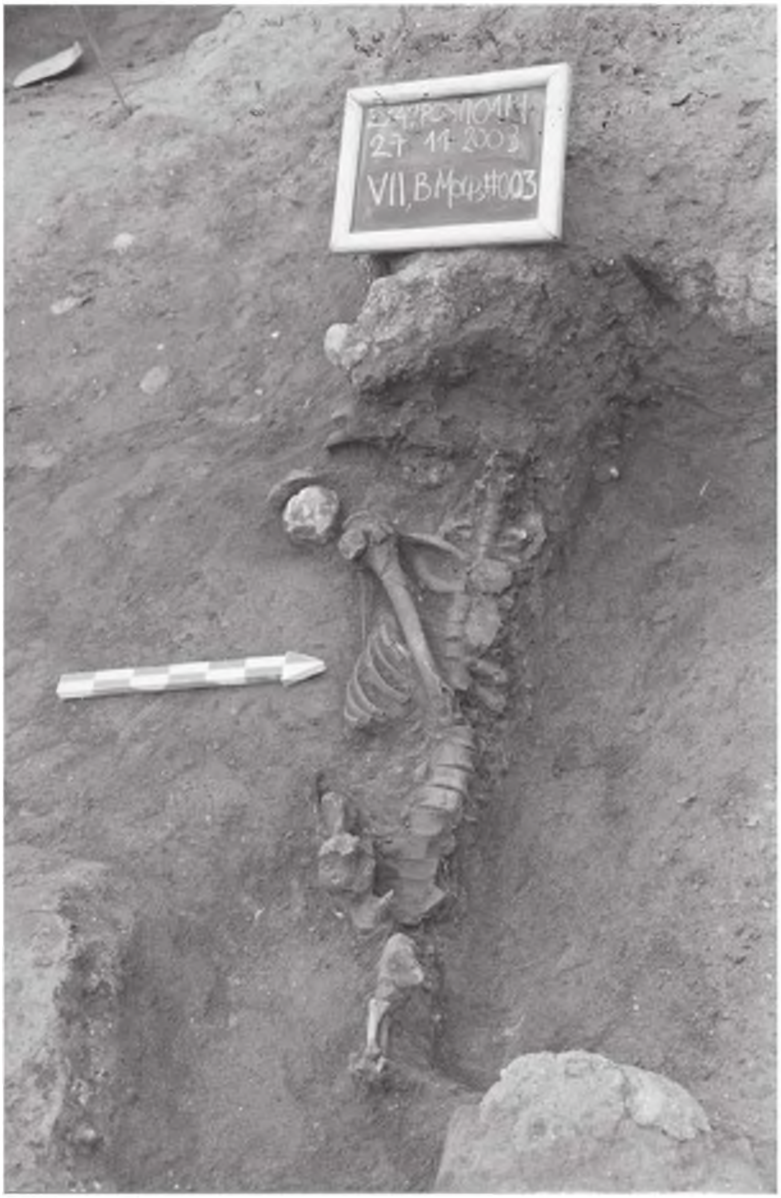

Fig. 9. Disarticulated skeletal remains of a young male at Stavroupolis. (Reproduced courtesy of Dimitrios Grammenos.)

concern to promote shared ideals and strategies of social reproduction and memory making—for example, an idea of a collective body of community ancestors (Triantaphyllou 1999: 131).

Discussion and Conclusions

Although the relatively slow degree of social transformation during the Neolithic may explain our search for mechanisms that ensure stability and controlled change, these mechanisms become successful only through the micro-scale and short-term agency of the household. Greek Neolithic households vary considerably in the ways in which they organized their daily lives, promoted their own varied motives and goals, and expressed their identities, containing within themselves the means to create social distinctions and asymmetries. The multiple scales of external and internal variation in architectural patterns, the different modes of production and exchange, the variable forms of ritual and symbolic practices—all suggest a great potential for tensions and contradictions between households and between household and community.

Despite this variability, an equally distinct degree of social cohesion ran within and across communities as a result of complex social interrelationships attempting to emphasize uniformity and collective identification. The dominant forms of social identification, as expressed for example, through settlement layouts and patterns of distribution and consumption of material products, appear to revolve around the village community. It seems that it is the community as a whole that displays status to the world and that sets limits on the extent of differentiation and domination of individual social units. At the same time, the households, as major keepers and transmitters of economic and symbolic capital throughout the Neolithic, were also personal products involved in the construction of their own identity and the promotion of their own concerns, thus creating the potential for the existence of groups with limited, cross-cutting, and alternative interests.

Such discrepancies between households and between household and community leave little space for stability and rigidity. Interestingly, they are materialized through largely similar and interrelated processes, revolving around architecture, economy, ritual, and burial. These processes reflect commonly accepted material means and practices within a society for achieving either individual or collective distinction, as well as conflicting strategies of social reproduction through different manipulation at different scales, contexts, and times. What we see is a complex and varied picture of a continuous tension between differentiation and unification, diversity and uniformity, and individual and collective identity.

Concepts of the household seem to have become more individualized and diverse through time, and this might have emerged as a reaction to the increase of community living and control and the ever-present forces of social integration that attempted to downplay the individual importance of the household in favor of its collective importance. The tendencies of the bigger picture from Neolithic Greece so far suggest that, during the Late Neolithic, when the contradictions between wider social stability and household contingency and diversity seem to intensify, the wider economy and consumption also become more visible, and collective practices also intensify. For example, it is in the Late Neolithic that we see more conclusive evidence for collective rituals in the form of ritual feasting and large-scale (structured?) deposition. Larger-scale, more public architectural works, such as the construction of stone enclosures, the leveling of large areas within settlements, and the undertaking of new building programs also seem to proliferate in this period.

There is no blanket application of contradictions and transformations across the regions and through time. They appear together with the first farming communities in Greece and continue until the end of the Neolithic. If there is a rule, it is one of different, and often fairly autonomous, local trajectories and cycles of change. It all depends on context, articulation, and meaning over space and time, something that we cannot understand with the rigid framework of all-encompassing typologies. Relationships between changes taking place within the household and those taking place within society cannot be explained in terms of simple and single models. Use of the household as a means for examining and interpreting social organization from the bottom up changes our perceptions of social evolution, which has been traditionally characterized as unilinear and consistent. The "devolution" of material culture and the deterioration of its quality toward the end of the Neolithic compared to earlier phases suggest that the social values of material products had changed. Many of the earlier communities also disappear in the Final Neolithic, when, apparently, the wider mechanisms of social interaction identified above were no longer in use. Incidentally, this might help explain why the Final Neolithic or "Chalcolithic" is neither observed everywhere in Greece nor well known. The reasons for break-ups and changes in households and communities of this kind are varied and multi-causal. They can collapse for economic, social, and cultural reasons arising from developments in wider society but also for internal reasons such as the disagreements inherent in life in a community or the threat of dissolution when a group decides to leave. A need for greater social recognition and an increasing concern with individual household reproduction may both have induced rejection of community control.

The social structure arising through all these practices incorporates a tension between the community and the household in a process containing the potential for both social asymmetry and social equality and for both empowerment and resistance to power. Collective control and individual autonomy coexisted, distinctions and differences remained fluid, transient, and susceptible to contestation, and the social structure was constantly in a state of flux. Rather than fixed or objectified, social relationships between households and between household and community were a target for achievement and maintenance as well as for transformation. In this way, households acted as organizing structures for both differentiation and integration, and the very process of social reproduction incorporated the potential for both domination of and resistance to stable forms of social identification.

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Homemaking in the Early Bronze Age

Meredith S. Chesson

> "Across what must be accepted as a vastness or time and space and status, there is indeed a degree of complexity that confounds understanding and generalizing about Chinese houses, homes and families. Dwellings are the sites of reproduction, work, socialization, and leisure, which together animate the human relationships within a family, and often reach beyond an individual house to others in the broader community. Many, indeed perhaps most, Chinese houses have always been mere rectangles of walled spaces, with only the most elemental levels of spatial demarcation. Yet the physical layout of many Chinese houses are reveals the somewhat complicated patterns of relationships that express age, gender, and generational status, as well as child rearing and care for the aged. All too often, it seems that Chinese houses are in a continuous state of alteration in order to meet the shifting requirements of a household as marriages occur, new members are born, and other die. As the locus of family life, rural and urban houses serve as the arena for a household's production and consumption activities and reflect elements of their religious and cosmological beliefs." (Knapp 2005: 5–6).

Standpoint, Inspirations, and Homes

Henry Glassie (1975, 2001), among others, argues persuasively that one of the best ways to investigate a community, or even a society at the regional level, is to ground ourselves in the everyday lives of the people by focusing on the household, a fundamental building block in society and the locus of the vast majority of daily life (see also Allison 1999; Carsten and Hugh-Jones 1995; Chesson 2000, 2003, 2007; Kramer 1982; W. Matthews 2005a; Tringham 1991, 1994; Waterson 1990; Wilk and Ashmore 1988). Houses are a dynamic type of material culture that people create for themselves in a series of decisions involving the availability and desirability of construction and decorative materials. Throughout prehistoric and historic eras (and even today), people decided how, where, and what to use to build and to equip this space. These intricate decisions were (and continue to be) influenced by economic, political, religious and social networks, beliefs, and worldviews. Practical access to local and non-local resources vary (Glassie 2001). Thus, houses integrate the microscale of everyday life with the macro-scale of cultural regions, trade patterns, and social, economic, and political spheres. As evidenced by Knapp's statement at the beginning of this chapter, houses are much more than shelter from the elements, and they are socially conditioned remains that transcend space, time, and status.

Beyond the construction and outfitting of a house, several archaeologists have explored the material remains representing residues of daily, repetitive behaviors in an effort to explore how the social, economic, political, and ritual webs of everyday life were reconstituted, renegotiated, and changed at the household level (Atalay and Hastorf 2006; Hastorf 1991, 2009; Hendon 1996, 2000, 2004; Kus 1997; W. Matthews 2005a, 2005b, this volume; Michelaki 2008; Rainville 2000, 2005, this volume). Most if not all of these studies rely to varying degrees on recent research involving the theoretical frameworks fitting under the broad umbrella of "agency studies" and practice theory. These archaeological case studies encompass a wide range of specific approaches in archaeology, including theoretical frameworks of *chaine operatoire,* structuration, intentionality, phenomenology, citations, life histories of places and material culture, social memory, and landscapes and place-making (Dobres and Robb 2000, 2005; Joyce and Lopiparo 2005). Dobres and Robb (2005) argue that all of these theoretical approaches share two concerns: social reproduction and materiality.

The materiality of living spaces and places, combined with the cooperative efforts and goals of maintaining a residential group's survival into the future, transcend structuring influences of lineage and kinship and encourage us to conceptualize domestic lifeways as nested within larger and overlapping ideas about lived and imagined communities (Isbell 2000; Preucel 2000). In this essay, I rely on four overlapping and related theoretical strands: (1) landscape and place-making/ sense of place (e.g., Anschuetz et al. 2001; Ashmore and Knapp 1999; Basso 1996; B. Bender 1998; Bradley 2000; Feld and Basso 1996; Tilley 1994; Whitridge 2004); (2) sstructured agency and structuration (e.g., Dobres and Robb 2000, 2005; Gillespie 2001; Joyce and Lopiparo 2005; Williams 2004); (3) embodiment and lived experience (e.g., Hegmon and Kulow 2005; Joyce 2005; Kus 1997; Owoc 2005) and (4) social memory (e.g., Hastorf 2003; Kan 1989; Kuijt 2008). I find these theoretical toolkits helpful on multiple levels in linking the materiality of peoples' lives in the past with social, economic, and political structuring forces in their society. All four approaches are obviously related, intersecting between peoples' perceptions of living in physical spaces, the materiality of living in a human body, and the values that we attach to place, bodies, and identities in any given context. Moreover, they require the researcher to work on and in several scales of time and space.

Because of the spatial limits of this paper, I will not exhaustively discuss the theoretical and methodological frameworks in archaeology for all of these approaches. Instead, I prefer to mention them as the foundation for this research endeavor and my own interests in situating my research interests and activities (Haraway 1988; Wylie 2002). The theoretical perspectives mentioned above intersect and offer complementary ways to think about home-making. These theories inspire my thinking about daily life in the past and present and provide the basis for my standpoint for thinking about anthropology broadly and about archaeological practice, knowledge production, and the Early Bronze Age (EB) specifically. In thinking about EB communities in the southern Levant, we must consider daily, seasonal, yearly, and generational rhythms of life for individuals and groups played out across multiple types of built and non-built landscapes (Philip 2003). Additionally, my understanding of EB houses, households, and homes cannot be separated from their larger communities. In turn, I believe that the larger EB communities must be contextualized within their local histories. As I and others have argued elsewhere, diversity rules in terms of categorizing EB society. The EB communities on the southeastern Dead Sea Plain cannot be compared exhaustively to other walled towns and cities in the region without taking into account differences related to scale, environmental resources, sociopolitical complexity, and community histories of settlement, abandonment, and resettlement (Chesson and Philip 2003; Greenberg 2003; Philip 2003; S. Paz, this volume).

In this paper, I will focus on the case study of EB household contexts at Numeira, an EB walled town on the southeastern Dead Sea Plain, during the settlement's 250-year history during the EB III (ca. 2850–2600 cal B.C.E.; Coogan 1984; Schaub and Chesson 2007). More specifically, I will engage the concept of houses further by considering how we might investigate homes archaeologically. While researchers have described and discussed archaeological households for nearly three decades, I argue that we must make the theoretical leap between archaeological households and residential structures (which we generally think about materially as the architectural context and the people living there) to homes: something that is built, embodied, and enlivened by peoples' actions, thoughts, relationships, and aspirations.

I offer this paper as a type of thought experiment (LeGuin 1987), in which we can consider the concept of "homes" and the process of "home-making" (and remaking) as a part of peoples' lives in the past, just as it is in the present. I do not advocate an approach to the archaeological evidence for daily life as if we were reading a *Martha Stewart Living* magazine or watching an episode of "This Old House." Moreover, I am not suggesting that we use ethnographic analogies of homes and home-making without careful consideration of cultural and temporal contexts, the inevitability of diachronic change, and the challenging fluidity of archaeological categories (Campbell 2009). Chang's (1967) landmark article on the use of ethnographic analogy in archaeology established the inseparable connections between the two, and archaeologists, especially those working in prehistory, are bound by this structural relationship:

> Archaeologists and ethnologists will have to continue on their separate ways, even though a complete understanding of man [sic] and his [sic] culture must be a summation of their respective findings. But a methodological system based on the people provides useful experience for the study of the things, and vice versa. To say that ethnology and archaeology depend on each other may be extreme; but it is clear that neither can profit from extreme specialization. (Chang 1967: 234).

I argue that archaeologists need to deploy nuanced and contextualized analogies garnered from ethnographic and ethnoarchaeological fieldwork (Campbell 2009; David and Kramer 2001). Ultimately, we must accept and uphold a sense of responsibility to both the archaeological and ethnographic evidence (Joyce 2002). As archaeologists, historians, and anthropologists, we are obligated to construct stories about the past that are fragmentary, what Tringham (this volume) calls "recombinant histories," and to learn with a varying degree of uncertainty and ambiguity (Gero 2007).

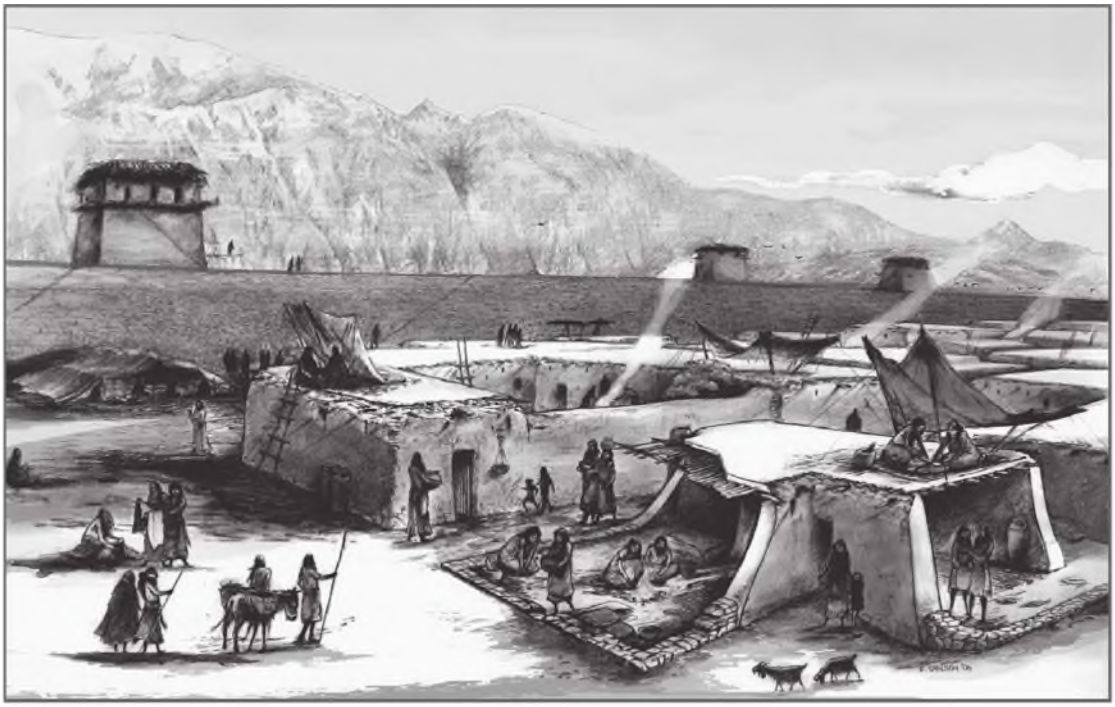

Fig. 1. Neighborhood reconstruction of Numeira, looking South (Eric Carlson).

Thus I conceptualize "homes" as arenas in which peoples' lives were filled with repetitive actions—behaviors that were meaningful and not thoughtless. In fact, I contend that these behaviors were so full of thought and meaning because they offered time for thought and reflection. This approach assumes that people may have felt many things about what they were doing throughout their days: elation, boredom, enjoyment, pride, wistfulness, bitterness, and even love. Following Kus's (1997) model for "sensuous human practice," I see the repetitive actions filling peoples' lives and living spaces as encompassed by feeling, emotion, and thought (R. Matthews, this volume; Tarlow 2000). The key here is that people were thinking and feeling; they were not simply acting as automatons while they made pottery, built structures, exchanged goods, prepared and ate food, and did the washing up. While evidence of these behaviors may be more accessible to archaeologists because of material residues, we should not forget that the vast majority of people's lives left little or no material residue: telling stories, teaching others, getting along (or not) with your neighbors and housemates, striving for excellence, gossiping, being creative, playing games, raising children, growing old, grieving, watching a loved one die, sleeping, defecating, and even making love (R. Matthews, this volume). Furthermore, when speaking about people I want to use "home" explicitly to encompass the full complement of types of people in the past with the full range of experience about what it means to be a human being living in groups. In my mind, then, homes were populated with the newborn, young, old, ugly, shy, gregarious, infirm, healthy, sterile, orphaned, and gendered people (fig. 1).

When I consider that people today and in the past survive, enact, and make meanings out of so many different approaches to these behaviors, I can only agree with Robb's (2007: 2) statement that "[h]uman ordinariness is an extraordinary accomplishment: it is the sheer ability of humans to believe and to act." It is this valuation of everyday experiences that I want to consider here in this essay, and to do so, I explore the concept of homes and the process of "home-making" in the past. Thinking about homes allows archaeologists to span multiple spatial and social scales (bodies, houses, tombs, neighborhoods, communities, cemeteries, kin groups, factions, regions) and multiple temporal scales (life histories, moments, days, months, seasons, years, generations, and even occupational histories). Home-making as a framework combines the comfortable archaeological practices of analyzing the built environment, craft production and consumption, and activity areas while explicitly peopling the past (Tringham 1991, 1994) and giving attention to more socially oriented archaeological research utilizing agency and landscape approaches.

Describing and Inscribing Homes

One of the clearest outcomes of this conference was the fact that researchers might have been using the same terms but meant very different concepts when speaking about houses, households, homes, residential units, and community. Many other scholars have specifically defined these terms over the last three decades of anthropological, ethnoarchaeological, and archaeological research of households (Allison 1999; Beck and Hill 2004; D. R. Bender 1967; Bowser and Patton 2004; Deetz 1982; Hammel 1984; Hendon 1996; Hutson et al. 2007; Kamp 2000; Kramer 1979, 1982; LaMotta and Schiffer 1999; Netting 1982; Rathje and McGuire 1982; Robin 2003; Yanagisako 1979). Needless to say, I have been inspired by these other researchers, though they may have meant a different set of values, meanings, and behaviors associated with these same terms. To aid understanding, I briefly offer definitions of residential units, households, homes, and communities as I think about them at this point in time.

Residential Unit

By this phrase, I mean a space in which people co-reside daily, or in some crafted and understood rhythm, and live out their daily lives. Residential units are physical spaces but are not limited to architectural spaces. In other words, a residential unit may consist of a cave, a tent or series of tents, a campsite with no shelters, an actual built structure, or some combination of these examples. Residential units may be associated with other features across the landscape within and outside of broader settlements, such as pasturage, agricultural fields, orchards, forests, separate workshops, fishing stations, water sources, roads, and trackways. Each of these related or linked spaces likely also involved values placed on them and their related people, and these spaces and interrelationships were fluid and changing through time. Residential units were the locale for more than subsistence-related activities and thus were the physical arena providing the space and the place for social, ritual, political, and economic negotiations, discussions, altercations, triumphs, and tragedies.

Household

I think of this term as an economic and social cooperative: a group of people, their skills, their material and immaterial resources. People in a household may co-reside, or not, but share a sense of belonging to some group or set of goals.

Home

The idea of *home* combines the concepts of residential unit and household but also heavily resonates with the daily practices of people related by real or fictive kinship, friendship, enmity, competition, cooperation, occupation, age, gender, ancestral ties, or "situation." It embodies the relationships and links connecting individuals to the members of the residential unit and others throughout the community through multiple webs of interaction and through time (Knapp 2005). Homes encompass physical and social landscapes, buildings, people, hopes, disappointments, the future, past, and present of people. It can be a town, a physical structure, a tent, a region, a riverbank, a forest, or a group of people. This movable feast presents an enormous challenge to archaeologists who are bound evidentially to the material world. At the same time, people live in a material and valued world. Values placed on people and things are important to remember, especially when we use our imagination to carefully construct possible visions of the past.

I suggest that we think of homes, rather than houses or households, because of the richer and messier feel of the concept. Adages about homes abound: home is "where you hang your hat," home is "not a place but the people," a person's home is "her/his castle." We set a lot of store in making our homes, building and equipping them to reflect not only our ideas about what a home should be but also who we should be/are, and then these decisions of equipping are linked to the availability of and a person's/group's access to local and non-local resources. Interwoven through this web of resources, identity, access, and intentions is the society's ideas about what a home should and should not contain (Glassie 2001).

Community

Several researchers have discussed ideas about community as real or imagined. Communities can be envisaged as groups of people that might be linked by place, occupation, ritual, kinship, age, or "situation." They can be defined as different, often overlapping, groupings of people, depending on which community you are talking about (e.g., community of elders, community of young people, community of craft specialists, community of ancestors). In many ways, the concept of community shares similarities with archaeological understandings of gender (Gilchrist 1999): context dependent, fluid, shifting, depending on life histories, and overlapping. There can be a spatial resonance to communities, and Whitridge's (2004) research into Inuit communities and the landscape are particularly apt. In stating that "communities come into being through enculturation of people to a local history embedded in places," Whitridge (2004: 220–21) emphasizes the localness of communities, socially and physically, while highlighting the daily actions that bring community into being and make it real to the people (see also Joyce and Hendon 2000: 143). Like homes, communities are works in progress, subject to contestation, renegotiation, and failure.

Taphonomic Concerns at Numeira

Before turning to the results of the archaeological evidence for homemaking at Numeira, it is important to clarify certain taphonomic issues associated with this case study. A short diversion into an explicit discussion of site formation processes at Numeira is necessary, especially because it is a "legacy" site and presents specific challenges in the analysis of the evidence. For example, we must be very clear when we distinguish between general diachronic change at the site (using both primary and secondary deposits) and when we speak specifically about primary behaviors within certain spaces across the town (using only primary contexts). With this methodological task completed, the following sections will describe the archaeological evidence for daily life at Numeira and consider ways that Numeirans made their homes.

The publication of Numeira is in process, and this site is a typical "legacy" site: the results of the excavations will be published three decades after it was excavated (Chesson et al., in press). Many other studies in the current volume celebrate modern methodologies, such as micromorphology, phytolith analysis, and micro-artifact analysis, all of which provide extraordinarily fine-grained views into daily practice. These methods were not available to the excavators of Numeira, although they employed the most up-to-date practices availale in the 1970s. Instead of lamenting this lack, we focus on the strengths of the excavation: large, horizontal exposure allowing for a diachronic study of settlement history and an extraordinary state of preservation of architecture and paleoethnobotanical remains.

Numeira is located on the southeastern Dead Sea Plain, approximately 13 km south of the largest EB walled settlement in this area (fig. 2a, b). It was excavated as one part of the Expedition to the Dead Sea Plain (EDSP) project in the 1970s and 1980s, and the guiding objectives focused on understanding the emergence of EB urbanism, with special attention to the environmental context and resources (Rast and Schaub 2003). Today, the site is roughly 0.5 ha, and the team's geomorphologist estimates that 50 m of downcutting in the Wadi Numeira destroyed at least half of the site (Harlan, personal communication). Three main excavation areas were opened in the course of four seasons (1977, 1979, 1981, and 1983; fig. 2a). The central area (roughly 950 square m) will be the focus of this discussion, since it has the largest exposure of domestic architecture at the site. Occupation at Numeira covered four major phases (1A/1B, 2A, 2B, and 2C), with subdivisions within all but the final phase.

The vast majority of spaces within the walled town of Numeira were filled with stone and mud-brick architecture. Residential units combined roofed and unroofed spaces, with connections between these spaces often, although not always, indicated by doorways. We reconstruct roofed spaces based on the presence of flat stones placed in the middle of floors. We also look for burnt beams and roofing material and for smaller spaces filled with pits, unbaked clay silos, and stone silos, which would have survived better under a roof. One will notice, though, that the presence of a silo or a dense concentration of pits does not automatically necessitate the presence of a roof. When possible, we attempt to have more than one potentially roof-associated feature (especially burnt beams) before "roofing" a space. It is assumed, but in no way demonstrated, that people used their roofs for workspace for drying, curing, storing, playing, sleeping, and general living. We do not have any indication from the records that there were goods from rooftops mixed in with the destruction debris; the excavators may not have recognized it, may not have been looking for it, or the evidence simply was not there. We assume these things about the function of roofs because of ethnographic parallels in the

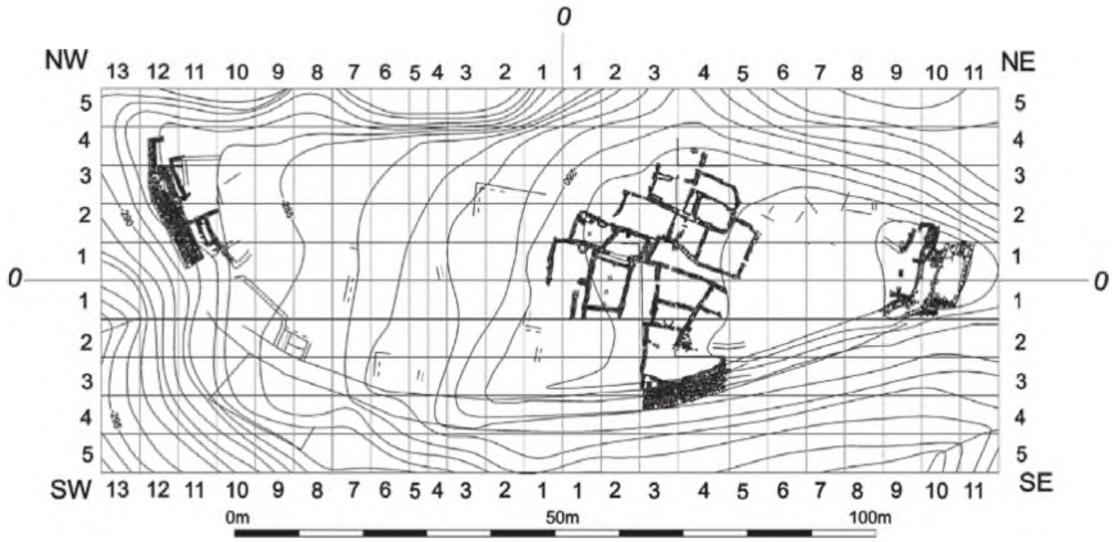

Fig. 2a (above). Topographic map with three main excavation areas at Numeira.

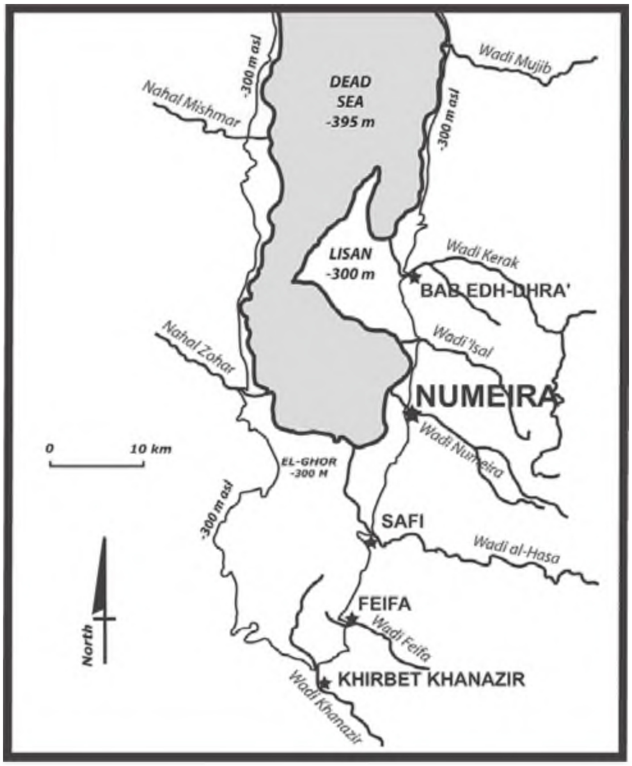

Fig. 2b (right). Location of Early Bronze Age settlements and cemeteries on the southeastern Dead Sea Plain.

area but also because there is good archaeological evidence for using roofs for daily life before and after the EB. All of our reconstructions incorporate some objects on roofs to show this potential.

The stratigraphy across the entire site is fairly uniform, and the field notebooks document the expectations of field supervisors to encounter a series of layering, beginning on the surface with a desert pavement, followed by a red-sandy, Aeolian deposit that covered the more archaeological layers. Below the red-sandy layer, excavators found the brown-gray-ashy material (called "BGA" throughout the notebooks) that in most contexts correlates to secondary destruction deposits formed after abandonment to the site when the buildings slowly decayed and fell in on themselves. Under this deposit lies the proverbial "good stuff" within behaviorally significant contexts: the primary destruction of the settlement, where large sections of the town burned, and where the excavators found large concentrations of burned plant and textile remains. Below this primary destruction deposit, excavators found the first of a series of floors correlating to the three major phases of occupation at the site (1A/1B, 2A, and 2B). In certain cases, several spaces were renovated and altered within one phase, and therefore the phase plans often combine these spatial shifts.

LaMotta and Schiffer (1999) have argued that archaeologists must pay careful attention to the site formation processes of house floors, and we have endeavored to sort out abandonment and post-abandonment processes for the floors and surfaces at Numeira. When possible we keep floor deposits separate from materials found above floors or from those in the fills below the floors. However, in several cases the excavators removed a floor along with the fill below it, resulting in a mixed context. Numeira offers extraordinary preservation of many floor deposits, and we consider the well-excavated floors to be primary contexts containing important behavioral information. Roughly 180 reconstructable vessels were found on floor contexts or as primary contents of pits. In addition to the whole pots, approximately 150 storage features were excavated. In all of these cases, we were very careful in categorizing the deposits within these pits, bins, silos, and basins as primary or secondary by weighing the quality of the excavation methods and documentation.

When we use the term "fill," we refer to material intentionally deposited by the EB people to prepare for a new surface. Fill was laid across earlier surfaces, inside pits/silos/bins, or against walls; the material making up the fill came from dumps somewhere in the site (or even outside the walls?) and thus was technically a primary deposit in some midden from a previous phase of occupation. We assume that people brought in fill deposits from nearby dumps or used temporarily abandoned structures as space to dump refuse; the fill thus must be considered a secondary deposit (though it had originally been an original deposit while still in the dump). Thus, fill is assumed to contain locally used materials from an earlier phase of occupation in secondary contexts. The materials cannot be considered to indicate primary, localized activities within the spaces; instead, we use fill deposits to give us a general sense of overall trends at the site. Only in a few particular cases, where the fill is odd (e.g., Structure 17 between 2A and 2B, to be discussed), do we consider it to contain primary behavioral information. In the case of Room 17, several steps were taken by the inhabitants to decommission the space by mixing primary deposits (several whole blades, five whole pots, and a sealed pit) within the secondary matrix of the fill.

At the end of EB life at the site, Numeira seems to have been abandoned, for reasons that are currently unclear. At the end of phase 2B, there is a great deal of burned deposits in many areas, after which the space was never renovated or reused. Citing the burning at Numeira, researchers have suggested that the town was burned after an attack (Schaub, personal communication). However, I disagree with this interpretation, since we do not have any other evidence of warfare or conflict, such as weapons or large numbers of bodies. Some excavators proposed that people may have left the settlement with the intention of returning, and then never did, based on the fact that many doorways were blocked up. However, it is difficult to prove this linkage, since many times the excavators did not always clearly note the relationship between doorways, blocking, and floors. In cases where the final occupational materials were burned, we have to consider a number of possible explanations for burning, including post-abandonment lightning strikes, purposeful burning by the last inhabitants, or vandalism. Without a professional analysis of the fire and burning, it is difficult to ascertain the intensity, longevity, and directionality of the fires and to try to arrive at further interpretations.

Furthermore, archaeologists identified a few spaces people continued to live in after the major abandonment of the settlement in an occupation assigned to phase 2C. At this time, we can assume that the majority of people, for a variety of possible reasons, left the town and did not resettle there. Three spaces were used after this abandonment, a situation usually interpreted as evidence of squatters. It could be that these people made a home at the site, which might have felt like a ghost town, for enough time to harvest the wheat that was found in Bin 6 of Room 11. One interpretation of why people abandoned the settlement might be as follows: several residential units burned (perhaps due to lightening strikes, accidents, spontaneous combustion, or an earthquake and aftershocks) and most people abandoned the site, perhaps to go to a different town.[1] At least one household remained in unburned spaces. Perhaps they wanted to make a go of staying there, perhaps they could not bear to be parted from their home, perhaps they had a very elderly or infirm person who could not be moved, or perhaps some other tragedy or strong belief or feeling kept them there. I do not envisage these folks living there for more than one or two years and certainly not for a full generation. After one or two years, they moved away, possibly north to neighboring Bab edh-Dhraᶜ, after a fire burned the contents of Room 11.

Setting the Social and Physical Stage: EB Background and the EDSP's Research on the Southeastern Dead Sea Plain

With the theoretical and methodological frameworks and concerns that influence research at Numeira established, I now turn to my primary question: how did people make their home in the walled town of Numeira during the EB? First, I will begin by setting the chronological and geographical stage of the EB I–III.[2] During this 1300-year span, people in the southern Levant invented a new kind of living place: the walled settlement. They also profoundly altered their living and working landscapes within settlements and across the surrounding landscapes. People inhabited settlements surrounded by large, high walls, and these walls were maintained and reinforced over several generations. People could often see other walled settlements from these walls. Interestingly, a type of horizontal stratigraphy has been documented at several sites, with certain sites being abandoned and new settlements being settled (e.g., Greenberg 2003). This means that the viewscapes (Owoc 2005) of EB peoples included inhabited walled towns, deserted/abandoned towns and earlier settlements, extensive terracing with orchards, expanded pasturage, and agricultural fields, new tracks and roadways, irrigation works, and in some cases cemeteries (Chesson 2007; Philip 2003). Thus, they inscribed their new way of life and their new sense of physical and social communities visibly and durably into the landscape through which they moved.

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[1] Possibly even to neighboring Bab edh-Dhraᶜ, which remained inhabited for an additional 250 years (Rast and Schaub 2003).

[2] For a more in-depth overview, see Philip 2008.

The archaeological evidence for life during the EB demonstrates a wide diversity in terms of scales of settlement, economic structures, political complexity, ritual practices, and social differentiation. There is no easy, normative set of political, economic, architectural, material culture, ritual, or social structures. For this reason, local histories, developments, and resources must have been crucial forces influencing and shaping the expression of EB life throughout the entire region. Despite this diversity, archaeologists still see similarities in the organization of space within EB walled settlements. In a general sense, archaeologists have excavated five types of spaces within settlements: ritual, residential, non-residential (often interpreted as palaces, administrative complexes, or non-residential storage facilities) contexts, open plazas (interpreted in some cases as market areas), and fortifications and gate systems (Chesson 2003). When burials occur, they are found outside the walls of the settlement, as at Bab edh-Dhraᶜ, Tell el-Umeiri, and Jericho (D. Ilan 2002).

For the purpose of this chapter, I focus on EB domestic contexts at Numeira, but comparable types of spaces have been excavated at many sites throughout the region including Abu Kharaz, Arad, ᶜAi, Handaquq South, Beth Yerah, Yarmouth, and Zeraqon (Amiran et al. 1978; Amiran and Ilan 1996; Chesson 1998; Fischer 2008; Genz 2002; Greenberg et al. 2006; O. Ilan 2001; Miroschedji 1988). Excavations at these other sites demonstrate that, though residential units tend to combine many similar elements, the shape, scale, and outfitting of these contexts differs from site to site. Additionally, I want to emphasize that seeing homes in these towns means that we have to consider the domestic contexts as one small part of the overall physical and social community: homes were not inhabited in a bubble, and people moved to, from, and between all types of spaces in walled towns.

To continue this discussion, I will focus on two basic questions about residential units at Numeira and their place within the greater walled settlement. (1) How do we identify residential units and households in the archaeological record? and (2) what evidence can we find for home-making on a daily, seasonal, yearly, or generational basis?

Archaeological Evidence for Homes at Numeira

Like many other excavated residential units in EB walled settlements, Numeira's domestic contexts included roofed and unroofed spaces and contained features associated with food preparation, storage, and consumption, storage of non-food items, and craft production. The earliest domestic spaces at Numeira (Phase 1A), however, contained no architectural remains aside from pit features (fig. 3). They were arranged in a roughly rectangular arrangement, especially in the northeastern section of the central area, and this suggests that they may have been organized around activity areas to process or unload agricultural products or possibly around tents. In the field notes, excavators referred to the persons of this phase as the "Pit People."

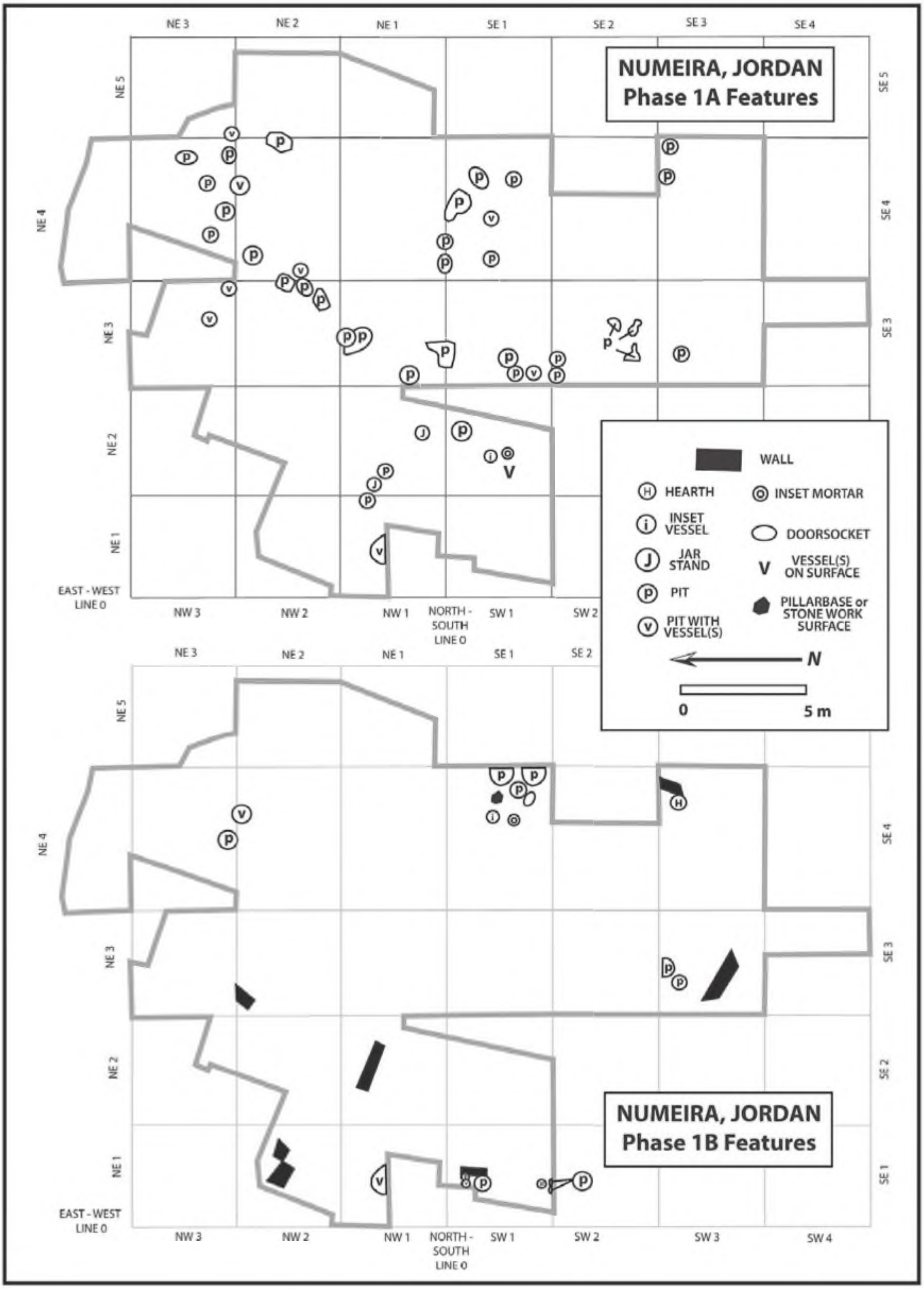


Fig. 3. Plan of Phases 1A and 1B.

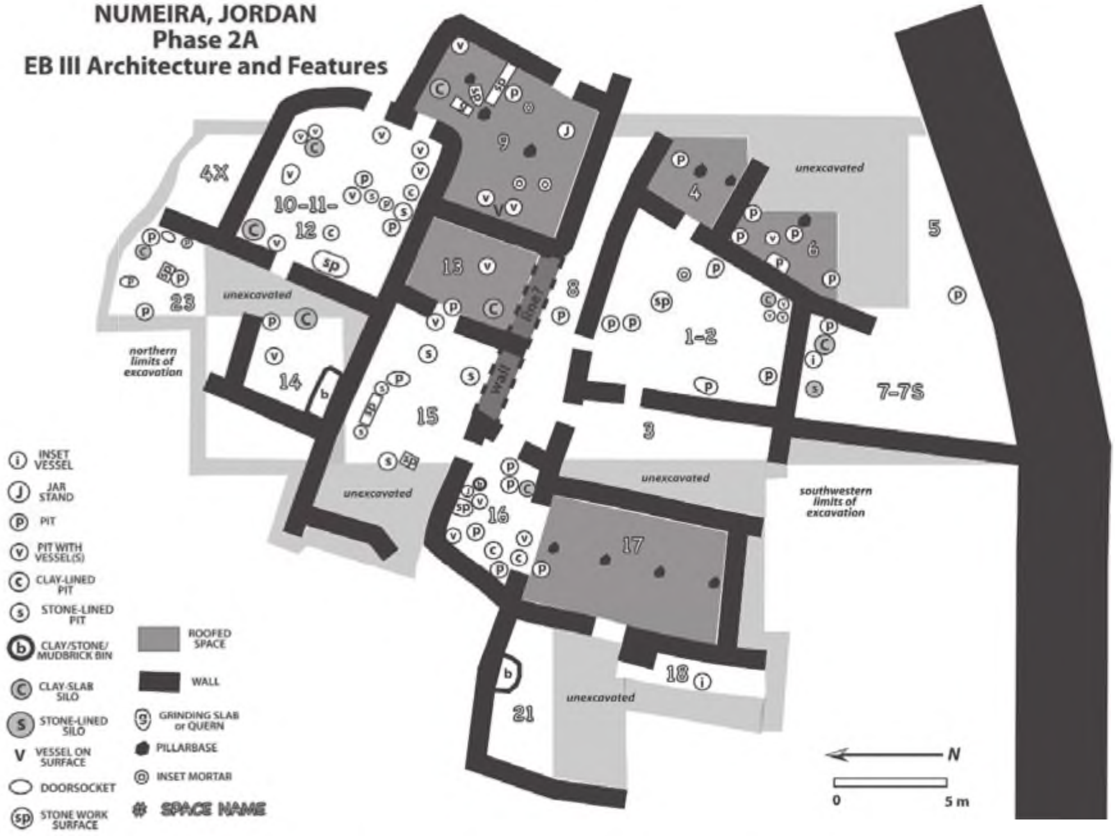


Fig. 4. Plan of Phase 2A, with units and storage features.

In Phase 2A, the walled town was born (fig. 4). People constructed stone foundations for buildings and used more perishable material (mud brick or wood) as superstructures for the buildings. In many cases, the excavators cleared a great deal of stone fall from residential units, and these contexts are interpreted as stone architecture that may have underlain plastered faces on interior and exterior walls. The inhabitants built a 2.5-m-wide wall around the site, with at least two towers and a gate system. Architectural units combined roofed rooms and unroofed courtyards, and sometimes were separated by a street or alley space. In joining rooms with courtyard spaces, we have interpreted three units in Phase 2A: the Northeast Residential Unit (Rooms 10, 11, 12, 14, 23, and 4X), the Southeast Residential Unit (Rooms 1–2, 3, 4, 6, and 7–7S), and the Ritual Complex Unit (Rooms 17, 16, 15, and 13, and Alley 18).

In Phase 2B, several spaces were renovated and we estimate that the amount of roofed spaces increased substantially (fig. 5). The major changes from 2A to 2B involve the division of open courtyard spaces into roofed and unroofed spaces (for instance, Rooms 10, 11, and 12; Rooms 1 and 2) and the decommissioning of the 2A Ritual Complex (Room 17) and its conversion into a Residential Unit. In joining rooms with courtyard spaces, we have interpreted three units: the Northeast Residential Unit (Rooms 10, 11, 12, 13, 14, 23, and 4X), the Southeast Residential Unit (Rooms 1–2, 3, 4, 6, and 7–7S), and the Southwestern Residential Unit (Rooms 15, 16, 17, 21 22, and Alley 18).

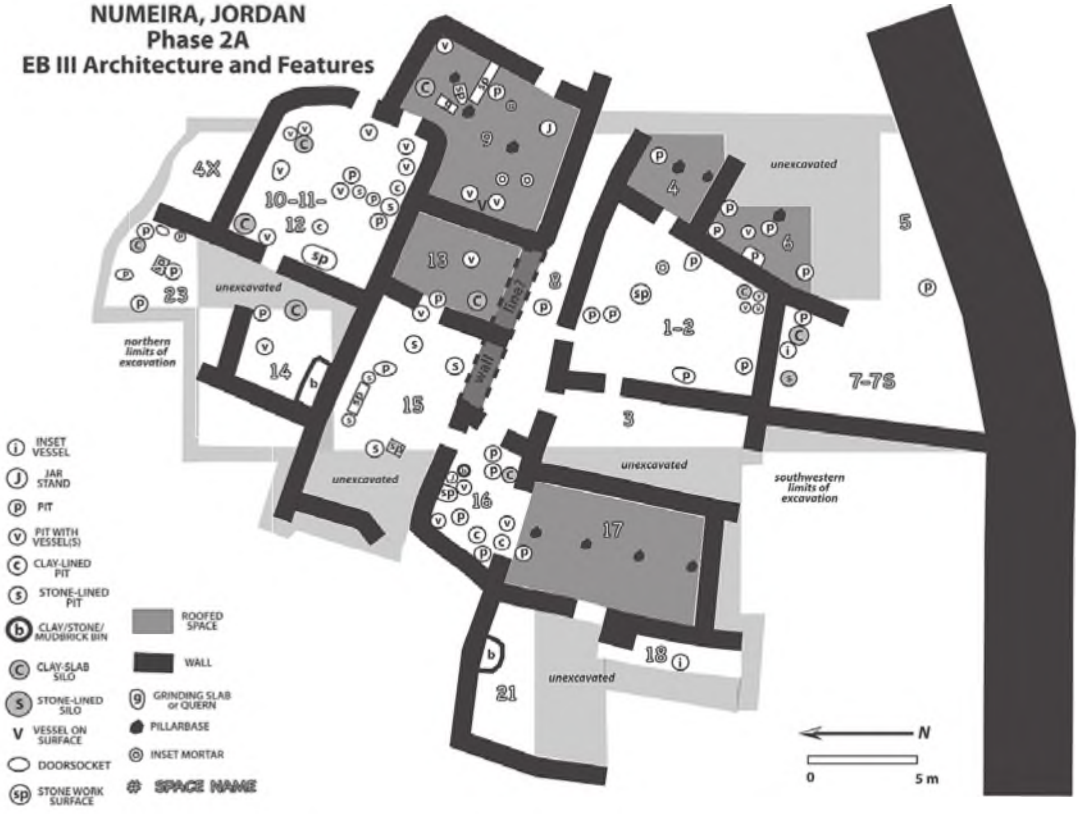


Fig. 5. Plan of Phase 2B, with units and storage features.

Examination of the Northeastern Residential Unit throughout Phases 2A and 2B provides a quick introduction to many of the typical EB features found in living spaces at Numeira (figs. 4 and 5). This compound combined roofed and unroofed spaces and was bounded on the southern side by Street 8. People built features for cooking, grinding, and storage of foodstuffs, including clay silos, pits, bins, stone platforms, grinding slabs and mortars, hearths, and clay ovens (tabuns). Architectural features include pillar bases, doorways, interior dividing walls (possibly only a meter or so high, judging by ethnographic parallels), thresholds, and door sockets. Space within these structures allowed room for sleeping, eating, and socializing. It is also conceivable that many of these same activities occurred on the roof of the residential unit, although there is no direct evidence at Numeira.

The artifacts and material remains found within the Northeastern Residential Unit over 2A and 2B provide a general guideline for thinking about archaeological signatures of residential spaces in the settlement. A wide variety of pottery vessels were found in primary contexts across this space, attesting to storage, preparation, and consumption of foodstuffs. Many pottery vessels were found in pits and the majority of these were storage vessels. Two flint blades were also found in pits with storage jars, and fragments from multiple bone awls, ceramic spindle whorls, stone loom weights, and fragments of at least two stone palettes were found on floors in this compound. A plastered impression of a basket bottom was recovered from the floor of Phase 2B Room 13, sitting next to three bins containing barley seeds. Most of these remains can be associated with animal husbandry, the use of secondary products in weaving, spinning, and basketry/matting production. Other objects, such as sickle blades, grinding stones, and cereal and fruit remains reflect reliance on an agricultural economy.

In other areas of Numeira, carbonized grains, raisins, and other plant remains attest to the importance of food storage. In many of the same contexts where preservation of plant remains was excellent, excavators also found burnt textiles, suggesting that other types of materials were stored. Gaming pieces and/or ground-stone game boards were recovered at Numeira, as well as cylinder seals and sealings on ceramic vessels. These other types of objects suggest evidence of social interactions during which economic, interpersonal, political, ritual, and even philosophical discussions may have occurred. Essentially, these remains attest to the wondrous wealth of materiality and the complex interactions in peoples' everyday lives in Numeira.

The transition between Phases 2A and 2B in Room 17 offers an interesting case study in how to unmake ritual space and convert it into a residential space (figs. 4 and 5). In Phase 2A, Room 17 was part of the Ritual Compounds that comprised Rooms 17, 21, 16, 15, 13, and Alley 18. The 2A ritual space in Room 17 contained four pillar bases with three storage features placed in the space between Rooms 17 and 16. Excavators found no hearth or oven features, no grinding stones, slabs, or mortars, and no evidence of the full suite of features typically associated with residential spaces. On the floor, the excavators recovered two bone awls and four fragments of other bone tools, a sickle blade, two flint objects, and several ceramic vessels. Most of these vessels are associated with serving (cup and pitcher) and short-term or small-scale storage (amphoriskos and narrow-necked jar; Rast and Schaub 2003: table 11.8). Comparisons can be made between pillared broad rooms at Bab edh-Dhraᶜ and Yarmouth as ritual structures (Nicolle 1999; however, see Greenberg et al. 2006 and S. Paz, this volume), and Room 17 is sufficiently different in our eyes to state that it is not residential and, furthermore, that it is also likely ritual in nature.

In the transition to Phase 2B, people sealed the pits between Rooms 16 and 17 and laid down a fill layer and a new floor. While this type of process is evident throughout the site, special preparations were followed in Room 17. A holemouth jar and associated flint blade was left/placed inside one of the pits, which was subsequently filled and sealed with a shallow bowl turned upside down. This bowl was then set into place by a mud-plaster covering. A new wall separating Rooms 17 and 16 was constructed over this pit and the pillar base located directly to the east. In the fill covering the floor of Room 17, people added five flint blades and five complete vessels, including a miniature holemouth jar, a vat, a medium-sized holemouth jar, a bowl, and a small bowl. In no other fill deposit at Numeira did the excavators find such a concentration of complete pots and flint blades.

On top of this fill, the EB inhabitants constructed a new floor with several typical residential features: two tabuns, two mortars, four storage pits, and a jar stand. One store-jar was found on this later floor, along with two flint blades and a fragment of an unidentified stone object. One or two pillar bases may have been maintained during Phase 2B, and thus we have reconstructed this space as roofed. Taken separately, the Phase 2A and 2B spaces are not exceptional. What is noteworthy in this context is the unique assemblage in the fill that suggests we may be viewing evidence for

Table 1. Material and Immaterial Wealth in EB Homes at Numeira.

Material Wealth Tied to People	*Immaterial Wealth → People with Access To*
• Physical structures in which people lived; • Livestock • Stored surplus (food and non-food, including animal fodder); • Lands, water sources, and productive resources associated with that group of property; • Material culture found in members' town houses and field houses; and • Material culture and ancestors' remains in charnel houses at Bab edh-Dhra`: • Goods made of non-local materials: beads of gold, carnelian, alabaster, ostrich egg, lapis, faience; • Non-local goods/imitations: slate palettes and Khirbet Kerak vessels; and • Copper-bronze weapons and stone maceheads	• Skills of household members • Stored materials in assumed administrative complexes; • Future productive and reproductive capabilities of household members; • Some degree of association with neighboring \ related households between communities (and to their material and immaterial wealth); • Ritual specialists associated with ritual complex; • Rights and responsibilities to land and water resources and all productive resources on these lands; and • Authority in managing labor for community-wide projects, such as fortification walls, building non-residential spaces in towns, and irrigation and terracing projects in the fields.

decommissioning a ritual space to turn it into something else (*sensu lato* Cameron 1990; Wilshusen 1986). This something else, the Phase 2B Room 17, has all the hallmarks of a residential space. For this reason, we can look at this case as an unmaking of ritual space and a making of domestic space.

In all of these examples, there exists clear patterning for the combination of built-in and movable features (like hearths, mortars, grinding slabs, and storage installations), with ceramic vessels (for food storage, preparation, and consumption), and craft production tools and spaces associated with residential units. These remains offer researchers material reminders of peoples' choices and options in building and equipping residential units. I turn now to the more nuanced, and less tangible, efforts to make a home in EB Numeira.

Materiality of EB Home-Making at Numeira: Case Study of Storage

The next step in this process is to make the intellectual leap from residential unit to home. Home-making is in many ways more than simply making a place to provide shelter from the elements. It is also the creation and crafting of a group identity within several nested and/or co-mingled communities. Following Joyce and Hendon (2000), I see home-making as a social practice with specific moral, economic, ritual, and political values associated with the people engaged in the process. EB homes included their inhabitants and the household's material and immaterial resources (Table 1; Chesson 2007). Much like Lévi-Straussian houses (Lévi-Strauss 1982), membership in a home likely included rights, such as access to resources, as well as responsibilities and obligations to help maintain the welfare of the group (Gillespie

2000a, 2000b; Joyce and Gillespie 2000). Access to water and land resources would have been coupled with the obligation to contribute to agricultural and pastoral production, as well as craft production and the exchange of goods and materials.

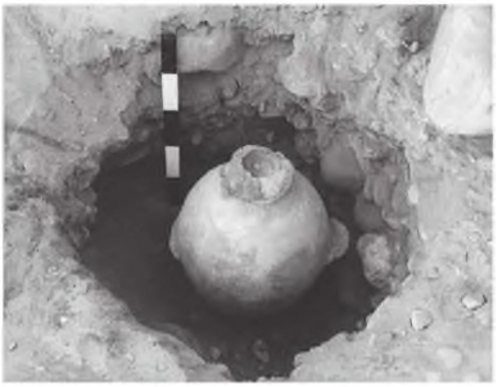
Beyond these economic responsibilities, members would undoubtedly have been linked to social, political, and interpersonal duties and networks that extended outside homes. When we think about the life histories of homes and of the people living within them, we begin to see how connections between homes might have been nurtured over generations. I imagine that age-grade groups were formed in neighborhoods, with children playing in the streets and working together and continuing through life. These age- and gender-grade groups continued to resonate throughout the life histories of the people and their communities and likely changed with the people themselves as inhabitants reached and passed through major rites of passage in their lifetimes, including births, deaths, marriages, adoptions, tragedies, and reunions

As an archaeologist investigating a prehistoric settlement, I do not possess the kind of fine-grained view of life at Numeira that permits me to track gendered, aged, and statused individuals as members of households stretching over generations. However, Numeira does offer the material residues of home-making by people over its ten or so generations. I would like to focus on one aspect of this process: storage.

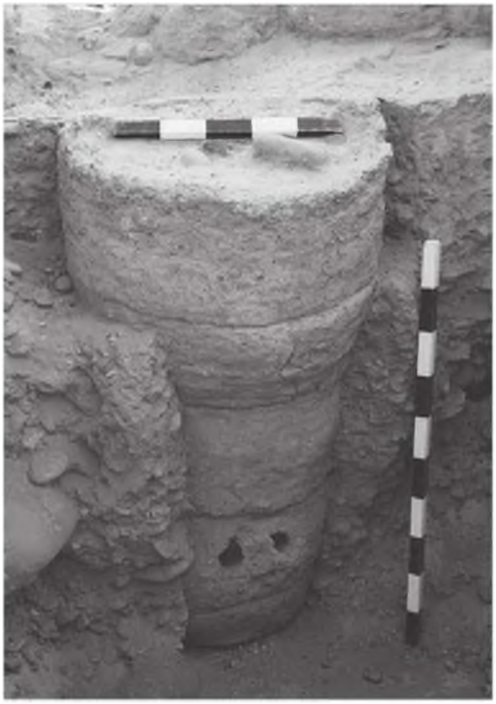
Archaeological Evidence for Storage Practices at Numeira

After stone walls, storage features are the most common archaeological feature excavated at Numeira. Based on the presence of approximately 170 storage features associated with the 250–year occupation of the site, people at Numeira spent a great deal of time, effort, and resources on building, maintaining, and using storage features. Taking inspiration from Hendon's (2000) research into the social value of storage, I argue here that storing goods, building storage features, actively storing both in sight of neighbors (in courtyard spaces) and in less visible areas (inside roofed rooms) was an important component of making an EB home at Numeira. At Numeira, in particular, I suggest that EB ideas about storing might have carried moral meanings and that fulfilling moral responsibilities in making and maintaining a home might be one of the reasons why the ancient inhabitants of the site dedicated such space, time, and resources to this practice.

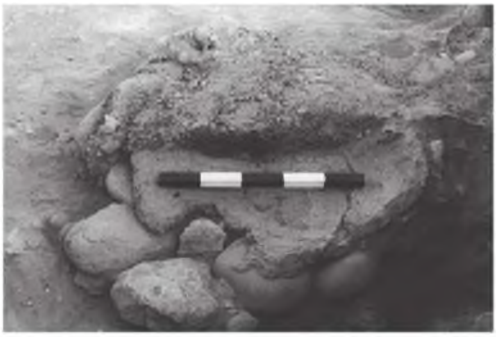
Anthropologists have long been fascinated with the idea of storing and exchanging possessions and resources, and they have approached this human behavior from a wide variety of methodological and theoretical perspectives (D'Altroy and Earle 1985; DeBoer 1988; Earle 2000; Forbes and Foxhall 1995; Frink 2007; Hunt 1998; Kent 1999; Mauss 1990; Oka and Kusimba 2008; Testart 1982; Weiner 1992). Stored possessions can be material and tangible (such as daily staples or heirlooms), intangible (linked to reputation and fame), or both simultaneously. The purpose of this paper is not to review the immense body of literature about reciprocity, keeping-while-giving, or exchange patterns. Instead, I want to focus on the storing aspect of keeping something or some things and follow Hendon's (2000) argument to suggest that storage is a valued behavior resonating across economic, social, moral, ritual, and political realms, often simultaneously.



a. Pit: Room 11 (NE 4/2) Locus 16.

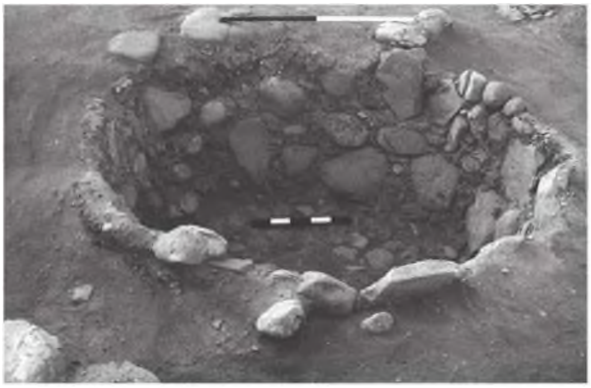


d. Clay silo: Room 75 (SE 3/2) Locus 20 (Phase 2A).

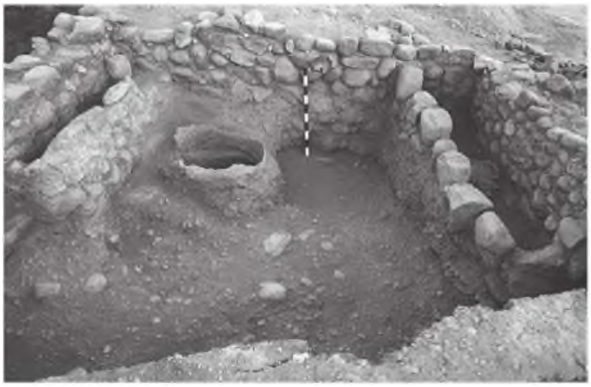


f. Poorly preserved storage features: Room 11 (NE 4/2) bin Locus 6 (Phase 2C).

b. Pottery vessels on floors, benches, platforms, or hung from ceilings (context needs to be found).



c. Stone silo: Room 16 (Room 16) Locus 13 (Phase 2B).



e. Stone/mud-brick bins: Room 14 (NE 3/3) Loci 9 (right) and 23 (left).

Fig. 6. Photographs of types of storage features at Numeira.

Table 2. Foodstuffs: Long-Term and Short-Term Storage at Numeira.

Dry	*Wet/Liquid*	*Fruits/Nuts*	*Preserved*
Barley Emmer Flax Chickpeas Peas Lentils Beans Herbs / Plants / Spices (medicinal and culinary)* Flour* Salt*	Water* Olive Oil* Wine* Butter* Yogurt* Milk* "Leftovers"*	Olives Figs Grapes Dates Pistachios	Dried Fruits (raisins) Cured Olives* Salted Meat* Salted Fish?*

*assumed (not found in the archaeological record)

At Numeira, the excavators encountered six general categories of storage features: (1) pits, often with vessels in situ; (2) pottery vessels sitting on floors; (3) clay silos; (4) stone silos; (5) bins or basins; and (6) poorly preserved storage features (fig. 6). People created pits by excavating into the sterile bed-pebble stratum and/or through earlier deposits. Pits were generally circular or oval in plan and most often conical and rounded in section. Clay silos and stone silos were both constructed by digging pits into earlier deposits and then lining the sides of the pit with flat paving stones or unbaked clay slabs. Inhabitants built bins and basins using various methods, lining shallow pits with small cobbles and stone slabs to make basins, or building above-ground bins with stones, mud bricks, and/or plaster. A variety of goods, including cereals, have been found in bins at the site, but other smaller and more portable containers may also have been placed in these installations. Our assumption is that clay silos held dry goods (like cereals), while subterranean stone silos would have been good storage solutions for liquids that needed to be kept cooler while stored in ceramic vessels.

In several instances, excavators found evidence for stored goods whose container or feature did not preserve well archaeologically. There is evidence of a plastered basket in Phase 2B Room 13, possible clay bins in Phase 2B Rooms 16 and 3, and several dense concentrations of carbonized foodstuffs and textiles that may have been stored in baskets, bags, nets, or hanging from ceilings or on walls. From these hints, we can surmise that the EB people at Numeira stored goods in more portable and perishable containers, or used roof beams, niches in upper walls, or space on floors to store food and non-food goods.

The best evidence for what people were storing emerges from the paleoethnobotanical record (McCreery 1980). Preliminary sorting and analysis of materials from the first two excavation seasons at the site offer insights into the agricultural and pastoral economy and diet of the residents. In several cases, excavators found dense concentrations of plant remains, often carbonized, in the central neighborhood. Grapes, barley, figs, emmer wheat, chickpeas, olives, flax, peas, lentils, and beans were the most common paleobotanical remains recovered. Burnt textiles, included

Table 3. Non-Food Items and Goods Stored at Numeira.

	Finished Goods	*Related Raw or Pre-Production Goods*
Ceramic	Pottery vessels Cylinder Seals Symbolic objects	Clay Water Shells and/or reused sherds for scraping/smoothing Decorating tools for painting or incising Burnishing tools String/twine Cloth for smoothing Temper/non-plastics Ores and vegetable for paints and slip colors Slow wheel/tournette
Wood	Farming tools (sickles, digging tools) Bowls Staffs Handles Sieve frame Shelves Pendants Loom?? Symbolic objects	Timbers Reeds Wood for carving Woodworking tools
Bone/ Shell	Needles Awls Battons Beads Cylinder seals Bracelets? Symbolic objects	Bead blanks Drilling tools Bone Shells
Stone	Grinding stones Weights (fishing nets, sinkers, loom weights) Gameboards Slingstones Cylinder seals Beads Pendants Palettes Vessels Symbolic objects Scrapers Sickle blades	Canaanean blade blanks Hammerstones Soft hammers (antler) Flint nodules or cores

cloth and matting, were also found and lend support to the storage of textiles. Macrobotanical and phytolith evidence strongly supports the use of intensive irrigation to grow crops (McCreery 1980; A. Rosen, personal communication).

In our analysis of storage (Chesson et al., in press), we focus on two main categories of stored materials at Numeira: foodstuffs (Table 2) and non-food materials (Table 3). These stored goods would have been used for subsistence of the household

Table 3. Non-Food Items and Goods Stored at Numeira.

	Finished Goods	*Related Raw or Pre-Production Goods*
Metal	Knives Needles/Awls Beads Symbolic objects (axes, daggers) Rivets	Metal "nuggets" or "droplets" Broken/malformed metal tools to melt down crucibles
Textile/ Basketry	Clothing Shoes/Sandals Animal Packs Ropes Twine Baskets Mats Tents Symbolic objects	Bones for tools (awls, needles, battons) Wool Yarn Flax Thread Spindles Whorls Reeds Twine Vegetable matter for dyes
Leather	Shoes/Sandals Bags Animal Packs Harnesses or Bridles Clothing Symbolic objects	Bones for tools (awls, needles, battons) Hideworkers (scrapers) Vegetable matter for dyes Hides

members and relations and possibly for barter or other forms of exchange within and outside the settlement. These items would have been stored in short-term and/or long-term contexts depending on the nature of the material and its use. I argue that the extraordinary evidence for stored materials strongly suggests that people associated positive values with keeping stores of food and non-food goods in Numeiran homes, and in turn that storing at Numeira was an integral component of making and maintaining a home. In the next section, I will summarize the distribution of storage practices across space and time to explore possible changes throughout the life-history of the settlement.

Synchronic and Diachronic Patterning of Storage in Numeira's Central Neighborhood

As already discussed, the earliest evidence for life at Numeira derives almost entirely from storage features (fig. 3). While we have no architectural evidence for structures, the arrangement of the storage pits suggests that the earliest inhabitants may have used tents or other forms of perishable shelters associated with their stored goods. In the central area of Phase IA contexts, 44 storage features, all but 3 being pits, were excavated, along with 11 ceramic vessels. Of these vessels, 8 were found in pits and 2 others were storage jars on floors. Excavators found 15 storage features in the following Phase 1B contexts, built prior to the establishment of the formal walled settlement; 14 of these features were pits, 3 with storage vessels, and the 15th

Table 4. Summary of Storage Areas and Volumes in Units in Phases 2A and 2B.

Phase 2A	*NE res unit*	*SE res unit*	*SW ritual/non-res unit*
Rooms/spaces	9-10-11-12-14-23	1-2-3-4-6-7-7S	13-15-16-17-21-18
Area excavated (m^2)	111.64 m^2	154.27 m^2	211.97 m^2
Area storage features total	10.63 m^2	7.24 m^2	9.74 m^2
Area storage feature/m^2	0.095	0.047	0.046
Volume storage feature totals	2815.44 L	3418.76 L	3395.23 L
Volume storage feature/m^2	25.22	22.16	16.02
Storage vessel volume	1079.50 L	310.00 L	465.50 L
Serving vessel volume	9.920 L	0.800 L	10.980 L
Volume vat/deep bowl (food preparation)	8.600 L	0.000 L	0.000 L
Ratio volume of storage/ serving vessels	108.821	387.500	42.395
Hearth/tabun (oven)	0	0	0
Mortar/grinding slabs	3	1	0
Stone platform/workplatform	2	1	2 (none in Room 17)
Pillar base	3	4	4 (only in Room 17)
Non-storage pits (trash, foundation)	1	6	4 (none in Room 17)

Phase 2B	*NE res unit*	*SE res unit*	*SW res unit*
Rooms/spaces	9-10-11-12-13-14-23	1-2-3-4-6-7-7S	15-16-17-21-22-18
Area excavated (m^2)	124.76 m^2	151.11 m^2	215.94 m^2
Area storage features total	10.55 m^2	6.06 m^2	10.32 m^2
Area storage feature/m^2	0.085	0.040	0.048
Volume storage feature totals	4251.02 L	3309.60 L	7069.28 L
Volume storage feature/m^2	34.074 L	21.902 L	32.737 L
Storage vessel volume	1389.50 L	637.00 L	1000.50 L
Serving vessel volume	17.42 L	8.44 L	49.00 L
Volume vat/deep bowl (food preparation)	17.00 L	0.00 L	0.00 L
Ratio volume of storage/ serving vessels	79.77	75.47	20.42
Hearths	5	1	2
Mortar/grinding slabs	4	1	3
Stone platform/workplatform	4	7	0
Pillar base	2	0	3
Non-storage pits (trash, foundation)	0	0	2

feature was an inset storage jar on a Phase 1B floor: storage evidence predominates in the earliest occupations.

With the establishment of the walled town during Phase 2A, the inhabitants expanded the built space, including stone structures, courtyards, and storage features (fig. 4, Table 4). The central excavation area of this phase included 75 storage features, 34 non-storage features (including tabuns, hearths, grinding features, and trash pits), and an assemblage of 67 reconstructable or whole vessels in primary contexts. Storage vessels made up more than half of the vessels found in Phase 2A contexts (n=36, 53.73% of the assemblage). Inhabitants built several clay silos and one stone silo in the central area, and each residential unit had more than one silo feature in addition to the many pits placed in roofed and unroofed spaces.

In expanding this thought experiment to grouping spaces into residential or non-residential units, and ultimately considering what an EB home at Numeira may have comprised, I have grouped several indoor and outdoor spaces into compounds in Phase 2A (fig. 4). In this exercise, we can see two residential compounds (Northeast and Southeast Compounds) and one non-residential compound (Southwest Ritual Compound. Both of these units contain the hallmarks of EB domestic spaces, with the curious absence of hearths and tabuns. This lack may have more to do with the preservation of these features through the renovation of many of these spaces at the beginning of Phase 2B. The final grouping of spaces we have identified is the Southwestern Unit, whose architectural and artifactual characteristics seem to be more in line with a ritual, rather than a residential, compound.

In the transition to Phase 2B, Numeirans divided up two large unroofed spaces (10/11/12 and 1/2) with walls and roofed sections of these once large courtyards (fig. 5). They built new southern and western walls to Room 13, and blocked the entrance between Rooms 13 and 15. They also blocked the access to Room 15 from Street 8 (for at least one of the subperiods in Phase 2B, of which there were three), and blocked doorways from Street 8 and Room 15 into Room 16. They built a wall dividing Rooms 16 and 17, and changed the character of Room 17 from non-residential to residential. They added Room 22, roofed Room 3, and removed roofs in Rooms 9, 4, and 6. While many of these changes were significant, they worked with the previous floor plans and spaces, and the archaeologists found a great deal of continuity between Phases 2A and 2B (see also Frankel and Webb, this volume). For this reason, the groupings of units shifts slightly in a few cases, and still includes three major units: Northeast Residential Unit (Rooms 9, 10, 11, 12, 13, 14, 23 and Area 4X), Southeast Residential Unit (Rooms 1, 2, 3, 4, 6, and 7/7S), and Southwest Residential Unit (Rooms 15, 16, 17, 18, 21 and 22).

Phase 2B contexts in the central excavation area include 55 storage features, 34 non-storage features (including tabuns, hearths, grinding features, and trash pits), and an assemblage of 108 reconstructable or whole vessels in primary contexts. Storage vessels made up half of the vessels found in Phase 2A contexts (n=54, 50.00 percent of the assemblage), while serving vessels (n=51, 47.22 percent of the assemblage), two vats for food preparation, and one unidentified vessel completed the assemblage. Inhabitants built several clay and three stone silos in the central area, and each residential unit had more than one silo feature in addition to the many pits placed in roofed and unroofed spaces.

Comparison of the areas and volumes of storage features in these units in Phases 2A and 2B show a range of stored space and, presumably, investment in storage and stored goods (Table 4). A detailed examination of this evidence lies outside the scope of this chapter, but I do call the readers' attention to three observations:

1. The ratio of storage area to unit area attempts to minimize scalar differences in the units. Interestingly, in both Phases 2A and 2B, there is no clear pattern. For instance, in Phase 2A, the Southeastern Residential unit resembles the putative Southwestern Ritual Unit more closely than its Northeastern neighbor. In Phase 2B, the Southwestern and Northeastern units are more in line with each other. This difference may relate to sampling: we may be missing up to half of this unit. Alternatively, they may reflect the different individuals and needs of the house at the time of their abandonment.
2. While the storage/floor space ratio may show differences, the ratio of volume (liter) per square meter is more comparable between the Phase 2A Northeastern and Southeastern Residential Units. In Phase 2B, this relationship shifts, with the Northeastern and Southwestern Units being more similar. Once again, sampling and life histories of these homes may play into these differences.
3. In examining the reconstructable or whole vessels found in primary contexts, the ratio of storage to serving vessels demonstrates another difference between the areas we interpret as residential and the Southwestern Ritual/Non-residential units. In Phase 2A, there is a large range of variation between the three areas. In Phase 2A, the Northeastern and Southeastern Units are fairly similar, but the Southwestern Unit, also interpreted as residential, shows a major difference. This variation may reflect the large numbers of serving vessels found in Room 22 (part of the Southwestern Residential Unit).

While there are no clear patterns that suggest a minimum or maximum range of stored space, volume, or materials to help us definitively differentiate between residential and non-residential spaces, I argue that this non-pattern is exactly what we should expect if we take Glassie's (2001) research seriously. He deftly demonstrates the enormous range of how houses and homes come to be built, equipped, lived in, and experienced. Demographic, social, economic, and political factors all influence the size, composition, and longevity of household groups, and these emerge, expand, contract or dissolve within and between generations as the life histories of individuals and homes change.

Turning now to diachronic shifts in storage practices, Table 5 offers a brief summary of the comparison of storage in roofed and unroofed, or open, spaces in Phases 2A and 2B. At the outset, there is a striking similarity in the amount of floor area dedicated to storage across the entire area. This similarity does not extend, however, to calculable volume or to the relationship of stored goods in roofed and unroofed spaces in the two phases. These numbers demonstrate a marked preference for storage of goods in roofed (interpreted as more interior and less accessible and less visible) spaces in Phase 2B. Several of the open courtyard spaces in Phase 2A were subdivided and partially roofed during Phase 2B, creating more roofed space in the

Table 5. Distribution of Storage Features in Roofed and Unroofed Spaces, and Area and Volume by Type in Phases 2A and 2B

Storage in Roofed and Unroofed Spaces	*Phase 2A*	*Phase 2B*
Total area excavated	521.59 m^2	545.52 m^2
Area (m^2) roofed space	160.76 m^2	230.12 m^2
Number of roofed spaces	5	8
Area (m^2) open space	360.83 m^2	315.40 m^2
Number of open spaces	12	14
Number of storage features with known area	72	52
Total storage area	27.661 m^2	27.468 m^2
% roofed area used for storage	4.21%	7.44%
% open area used for storage	5.79%	3.28%
Number of storage features with known/calculable volume	60	49
Total volume storage features	9951.719 L	14669.170 L
Known/estimated volume (l) in roofed spaces	2856.685 L	9080.865 L
Known/estimated volume (l) in open spaces	7095.034 L	5588.305 L
Known/estimated liters/ m^2 in roofed spaces	17.770 L/m^2	39.461 L/m^2
Known/estimated liters/ m^2 in open spaces	19.663 L/m^2	17.718 L/m^2
Specific Storage Type	*Phase 2A*	*Phase 2B*
Number of pits with area	54	34
Total pit area	20.67 m^2	16.22 m^2
Percentage storage area by pits	74.73%	59.04%
Total pit volume	8476.49 L	6113.15 L
Number of silos with area	10	8
Total silo area	4.83 m^2	6.76 m^2
Percentage storage area by silos	17.46%	24.61%
Total silo volume	>1010.88 L*	7557.17 L
Number of bins with area	3	8
Total bin area	1.56 m^2	4.29 m^2
Percentage of storage by bins	<1%	15.62%
Total bin volume	>333.95 *L	>874.85 L*

* These figures represent minimum volumes, since the volume of all features could not be estimated with accuracy in statistical analyses (Chesson, Goodale, and Schaub in prep).

second phase. At the same time, the percentage of roofed space dedicated to storage almost doubled, and the storage volume per square meter in roofed space more than doubled. While people moved many of their stored goods inside, they also developed a greater variety of storage facilities. Phase 2B built and used more bins and larger clay and stone silos than in the previous phase, relying to a lesser degree on storage pits.

Some of the differences in the percentage of floor area in roofed and unroofed spaces that people dedicated to storage may reflect sampling issues and the incompleteness of excavation of a unit. On the other hand, we might interpret these differences as viewing a cross-section of storage behaviors at a different life-history moment of these homes and different communities within Numeira. In his analysis of North American prehistoric subterranean storage pits, DeBoer (1988) offered an explanation of "hidden" storage as an indicator of a "tension point between egalitarian and inegalitarian social formations, in which outcome is uncertain" (DeBoer 1988: 14). Although the people of EB Numeira definitely lived in what we might define as a complex society, the degree and structure of social differentiation in this community might be better described as heterarchically complex, with fluid boundaries in terms of access to status and resources (Chesson 1999, 2003, 2007; Chesson and Philip 2003). This means that Numeirans experienced social differentiation, but the range of status was not as great as might have existed at other contemporary and much larger sites such as Beth Yerah or Yarmouth (Greenberg et al. 2006; Miroschedji 1988, 1999).

Beyond DeBoer's potentially relevant model, multiple other scenarios exist to explain these differences in storage practices. For example, perhaps people moved their storage inside because of shifting status relations in the community or balances of resources among different homes in the settlement. Alternatively, storage of goods inside or outside might have been based on what material was being stored. For instance, stone silos were always located in roofed spaces, and they may have held liquids in pottery vessels that needed to be kept cooler in the hot summer months. If people stored more materials that were temperature sensitive in Phase 2B, then we might expect to see this shift to interior, less accessible, and cooler spaces.

One aspect of the question of storage practices at Numeira that still remains to be explored in a detailed manner is the relationship of storage to surplus. I am still awaiting paleoethnobotanical evidence that may allow me to track the distribution of different foodstuffs across space and through time. This research may help prove or disprove the existence of surplus storage at the site by comparing relative proportions of foodstuffs, especially fruits and cereals, to different population estimates and the necessary minimal levels of storage to support those people. The analysis of surplus and subsistence levels of storage may offer a more detailed and comprehensive avenue to investigate degrees of social differentiation and complexity in the community between homes and through time.

In approaching storage as a social practice with specific moral, economic, social, and political values, these trends through time and across space acquire a more human element. We can consider the decision-making process, with all of its human complexities of emotion, aspirations, realities of access, and tensions between individuals and groups. As people entered and exited the EB homes through birth, death, fosterage, marriage, and adoption, decisions to store different goods in various places most likely changed over the generations. Some of these long-term trends may be read into the patterns discussed previously. Storage was not the only, or most important, aspect to home-making at Numeira; it was, however, one resulting in extraordinary archaeological visibility. Ultimately, I see it as a worthy vehicle for peopling the past in our reconstructions of everyday life at Numeira.

Implications for Homemaking for Archaeological Practice

This discussion of home-making, relying largely on the archaeological evidence for the distribution and intensity of storage behaviors, as well as the architectural analysis of residential and non-residential units, offers proximate views into daily life of ordinary people at Numeira. However, it must also combine these basic patterns with considerations of ethnographic and ethnoarchaeological evidence for more comprehensive, holistic explanations and reconstructions in order to people the past (Bowser and Patton 2004; David and Kramer 2001; Horne 1994; Kramer 1982; Robin 2003; Tringham 1994, this volume). When we strive to people the everyday life of the past, however, we step outside boundaries of "normal" or "comfortable" household archaeology.

This thought experiment involving home-making, or "homes with faces" (Tringham 1991), takes us outside the boundaries of the traditional realms of "doing" household archaeology. The "meat-and-potatoes" of household archaeology involves much of what I have outlined here: exploring patterns of economic production, consumption, and exchange; activity analyses; food preparation; storage; subsistence; and architectural phasing and analyses of space. In this essay, I have strived to incorporate analyses with which archaeologists are less comfortable by considering, to the extent possible, the interior and exterior lives of people of all ages, genders, abilities, and status. In this less-comfortable zone, we can imagine people learning, growing, fighting, striving, and resigning themselves as they go to market, make crafts, exchange goods, participate in collective civic or neighborhood projects such as town wall construction and maintenance, irrigation, terracing and orchard maintenance, herding, shearing, and harvesting—all examples of the richness of sensuous human practice as outlined by Kus (1997).

People did not carry out the mundane activities of everyday life as thought-free, emotionless automatons outside the boundaries of social, economic, and political obligations and contexts. Beyond the quotidian life, we can imagine occasional important and communal events: weddings (and the negotiations, both intimate and more group-oriented, that led to the betrothal and marriage), adoptions of adults and children, funerals (and secondary mortuary practices), rites of passage, births, apprenticeships, moves to a new settlement, and participation in a town's and regions rituals and agglomerative celebrations, exchange networks and markets, and systems of fosterage and other social networking. Finally, we should leave room to consider the relationships and actions that might have not been "sanctionable", "normal" or "auspicious" by the society's "rules": affairs, elopements, murders, tragedies, accidents, dares, youthful indiscretions, risks, disappointments, and overwhelming sadness and bitterness that were and are woven throughout peoples' lives.

In illustrating sensuous human practice in our reconstructions (Chesson et al., in press), my co-editor and I have worked closely with Eric Carlson, who creates reconstructions for all of our publications. He makes a point of always having a mix of people in reconstructions: children, older people, and men and women in a variety of behaviors (fig. 7). These images include the standard actions of completing tasks represented in the archaeological record, but we also purposefully depict people

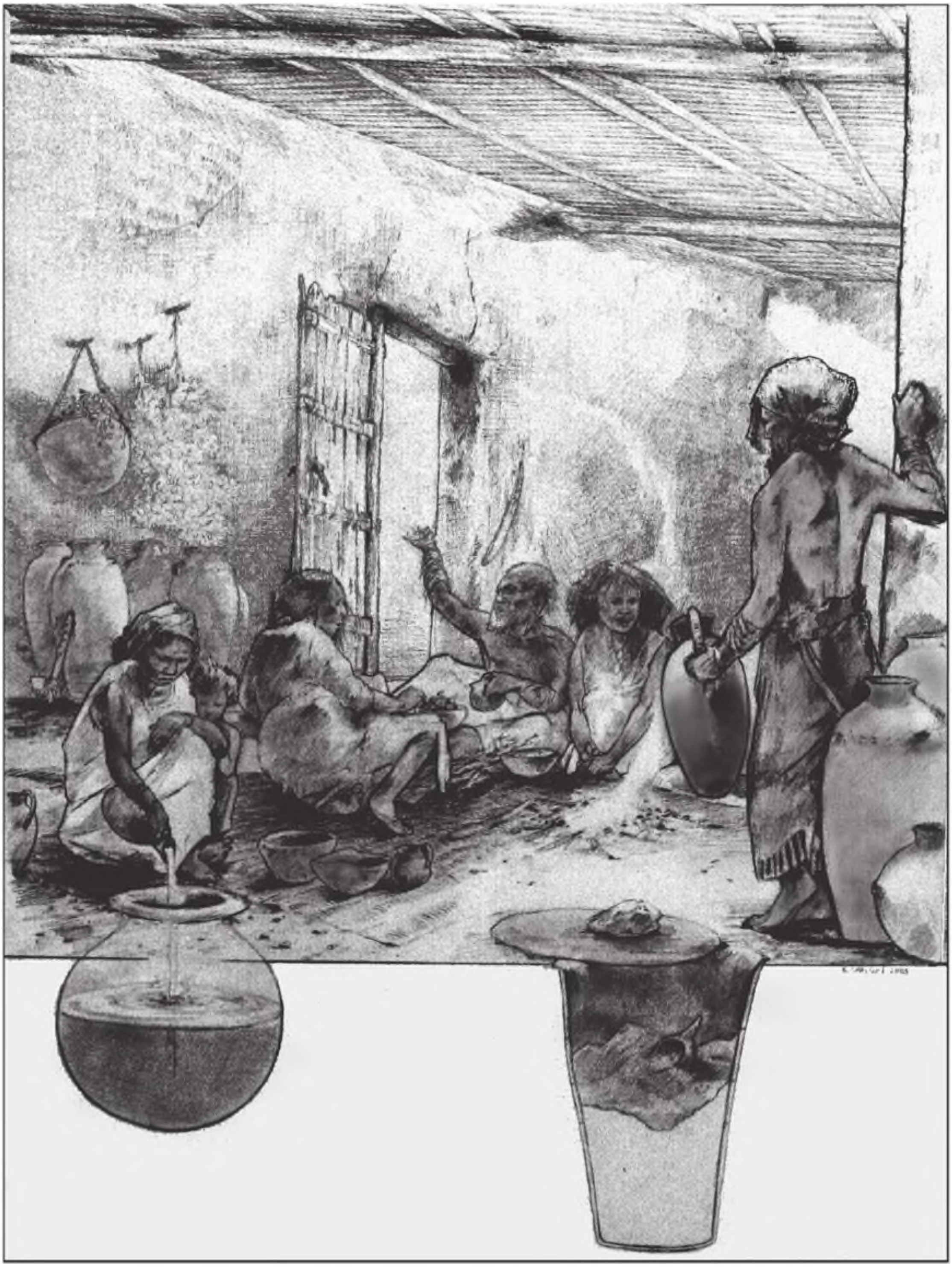


Fig. 7. Reconstruction of Roofed Space at Numeira (Eric Carlson).

talking, playing, mourning, arguing, telling stories, and thinking. When possible, he attempts to have more than one person, combining ages, genders, and actions that likely happened in living spaces inside and outside towns. For reconstructions from neighboring EB cemeteries and imagined funeral processions, Eric's drawings of people evoke the sense of mourning, energy, sadness, and also movement in the proceedings.

In many ways, Numeira's incredible preservation and broad, excavated expanses offer a unique context for exploring home-making. Even by the standards of "traditional" household archaeology, Numeira provides a wonderful case study in the methodological and theoretical concerns and potentials for reconstructing everyday life in this prehistoric settlement. While I focused on storage, I could have just as easily explored the distribution of vessel types, chipped stone tools, and ground-stone across the site and through time to explore daily actions of people using these materials. My chief objective was to explore how we can use Glassie's (2001) approach to understanding domestic life as a vehicle for examining larger societal issues. A secondary goal was to demonstrate the potential for peopling our reconstructions of everyday life, moving from archaeological evidence to the more human-filled elements of daily practice and interactions as people build and live within their homes and communities.

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Households through a Digital Lens

Ruth Tringham

Household archaeology, as this conference and other publications on the same topic have shown, has already developed a multitude of practices that combine theoretical standpoints, methodological preferences, and archaeological contexts in which to investigate households. In an encyclopedic article on the topic, I suggest that the aim of household archaeology "is to create a context in which a humanized reconstruction of the past may be nurtured, through the study of intra-settlement relations" (Tringham 2001: 6925).

Household archaeology developed in the 1980s and 1990s as the result of a growing interest in intra-settlement relations, but it is a subdiscipline that is neither unified, nor organized, and hardly recognized within archaeology. The aims and agendas of the archaeologists who carry out studies that are termed "household archaeology" are as variable as are the theoretical strands of archaeology itself (Tringham 2001: 6926). Having said that there is no consensus on what comprises household archaeology, I feel justified in focusing this chapter on a personal account of my exploration of its practice. I think it is important to understand that each archaeologist (as any other thinking person) transforms—or re-creates—themselves during their professional lives and that this, far from being a sign of flakiness, is a very good thing! During my professional life I have transformed my objects of investigation and my theoretical standpoints a number of times, sometimes very quickly as a result of an "aha" moment, sometimes less self-consciously and realized only after the fact. In retrospect, however, I have always thought of these changes as logical, cumulative, and positive. I have set this study of household archaeology as a personal journey because I feel that its transformation parallels in many senses my own professional journey. I recognize and respect that others might construct the history and current state of household archaeology very differently and do not presume to speak for the whole field.

I have drawn together in fig. 1 four or five strands of experience and practice (designated with a key in the figure) that come together in what I do on a daily basis and that comprise the professional directory mirrored in my version of household archaeology:

- History and Historical Context of Household Archaeology
- Methods of Investigation of Household Archaeology
- Sites of Investigation of Household Archaeology

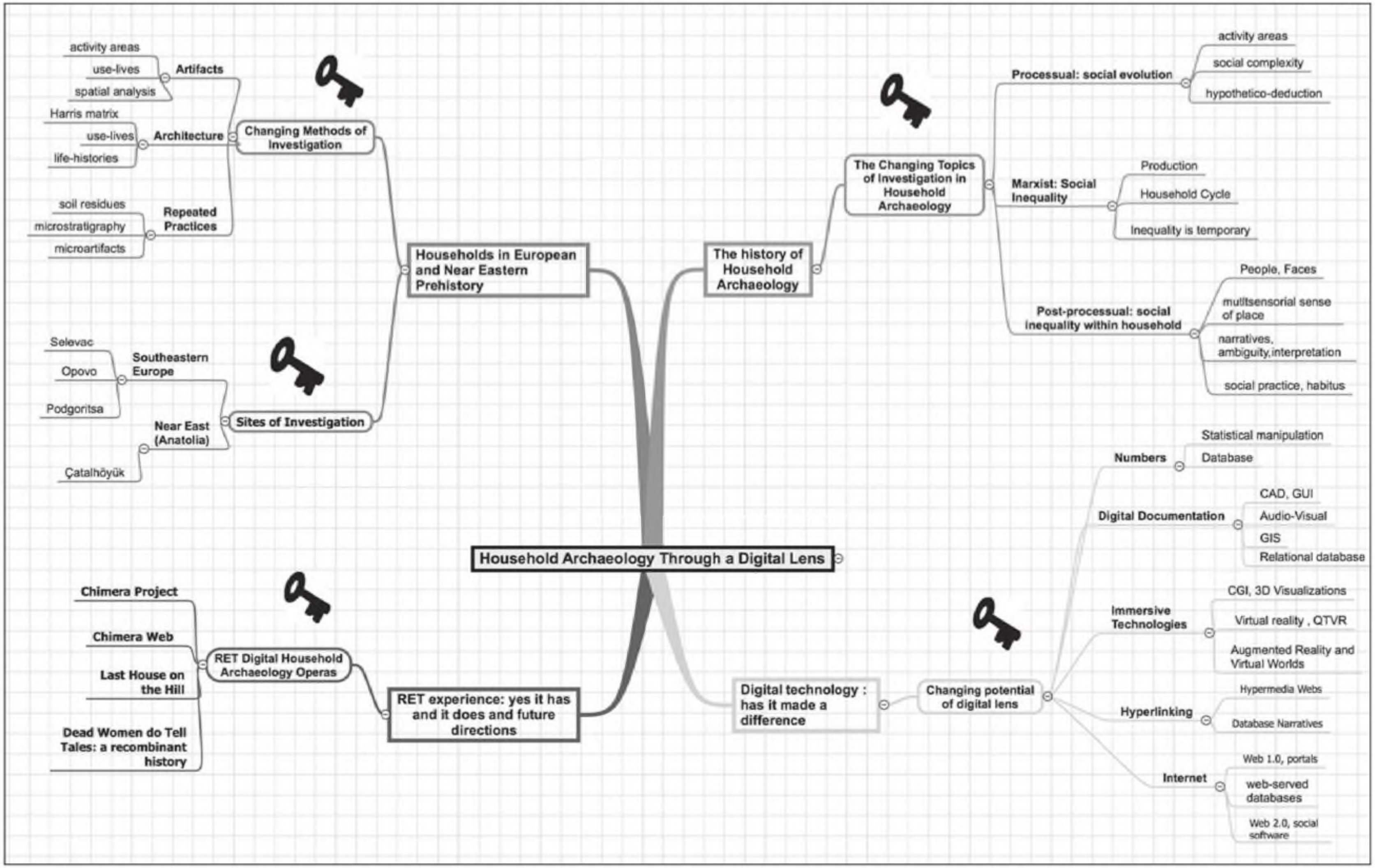

Fig. 1. Chart showing the five strands that are woven together in this exploration of the practice of household archaeology.

- Household Archaeology in the Context of the History of Digital Technology
- Creating the Digital Window to Household Archaeology

Each of these strands—not just those that have the word "history"—is considered along a time trajectory from the late 1970s to now.

The History and Historical Context of Household Archaeology

This history of household archaeology, as all histories, is constructed, selective, biased, and divided into three parts.

Processual Archaeology

When it was initially developed in the late 1970s, the study of households aimed at filling in the most detailed level of settlement pattern and activity analysis, which could then be extrapolated to make more general statements about demographic trends, specialized production, class structures, and complexity (for example, Flannery 1976). The development of household archaeology at this time was no accident. It was closely related to the growing awareness in the late 1970s and into the 1980s of the need for more rigorous testing of social evolutionary theories by building hypotheses that related directly to the empirical archaeological data—in other words, the development of Middle Range theory (Binford 1977; Clarke 1973; Goodyear et al. 1978; Raab and Goodyear 1984; Tringham 1978, 1990b). In the important volumes edited by Wilk and Rathje (1982a) and Ashmore and Wilk (1988), which really put the subdiscipline of household archaeology on the map, it was suggested that, since households "are the level at which social groups articulate directly with economic and ecological processes," their study would offer a chance for archaeologists to examine social adaptation (in a Functionalist sense) with direct reference to the empirical details of the archaeological record. In other words, household analysis would allow archaeologists to "bridge the existing 'mid-level theory gap' in archaeology" (Wilk and Rathje 1982b). However, in spite of the household being described as a "fundamental element of human society" and a Chacmool conference being devoted to the topic in 1988, household archaeology remained marginal to the mainstream of Processual (New) Archaeology. Perhaps the funding, time, and motivation was not available for any one project to investigate more than a couple of households in the detail required to (re)construct what individual households did. Such a small sample would not have been considered a valid scientific sample from which to extrapolate a complete settlement and make a valuable contribution to the macroscale trajectory of human social evolution.

Traditional Marxist and Neo-Marxist Archaeologies

Many of the early household archaeology papers in the 1980s were based in Marxist models of production and social inequality, and focused on what households *do*. This standpoint did not preclude their interest in Middle Range theory-building. Quite the contrary; the traditional Marxist and Neo-Marxist emphasis on production led them to take the lead in developing household archaeology as a strategy to build empirical hypotheses about social inequality and production that was based especially in the study of small-scale agricultural settlements.

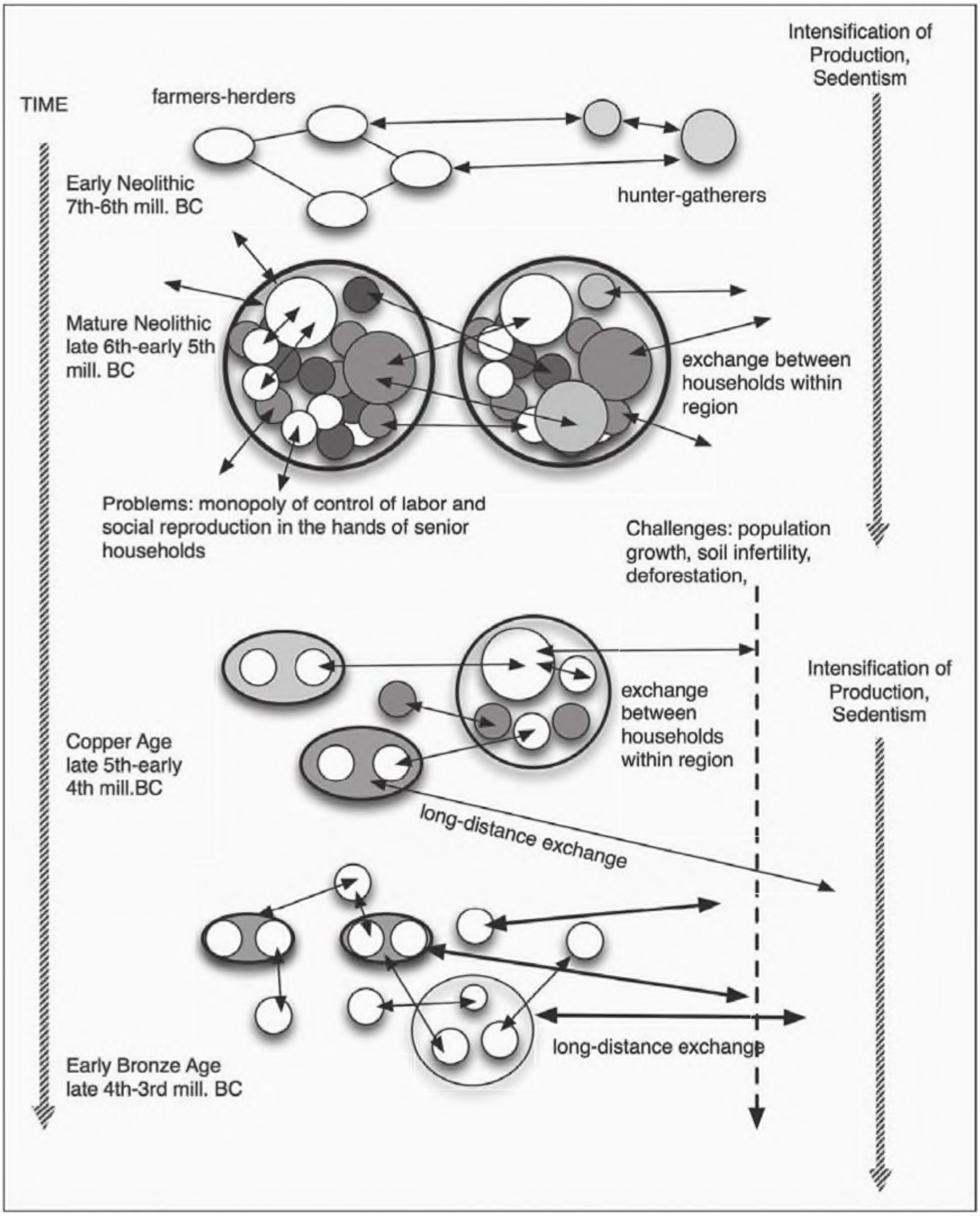
Intensification of Production, Sedentism
TIME
farmers-herders
Early Neolithic 7th-6th mill. BC
hunter-gatherers
Mature Neolithic late 6th-early 5th mill. BC
exchange between households within region
Problems: monopoly of control of labor and social reproduction in the hands of senior households
Challenges: population growth, soil infertility, deforestation,
exchange between households within region
Intensification of Production, Sedentism
Copper Age late 5th-early 4th mill.BC
long-distance exchange
long-distance exchange
Early Bronze Age late 4th-3rd mill. BC

Fig. 2. Model of the emergence of the household in Neolithic southeastern Europe (after Tringham 1990a: fig.16.3).

Neo-Marxist studies emphasized the importance of the function of households as the organizing units of cooperative labor, production, consumption and sharing of resources, the transmission of property and rights from one generation to another, and the creation and maintenance of ties and alliances with other units through marriage and other forms of exchange—in other words, social reproduction (Rathje and McGuire 1982). In the 1980s, these topics became the objects of investigation of many (but not all) household archaeology studies. The constraints of logical positivist rules on hypothesis-testing in archaeology and the inhibitions in transcending the empirical data of the archaeological record in the name of "science" prevented the social form of the household (that is, who lives there, with whom, and how they are related) from being included in these studies. However, these latter questions had always been of essential importance to social anthropologists and historians studying households who provided the inspiration for the archaeological studies in the 1980s (Arnould and Netting 1982; Goody 1972, 1976; Hammel 1984; Hammel and Laslett 1974; Laslett and Wall 1972; Netting et al. 1984; Wilk and Netting 1984; Yanagisako 1979).

Social inequality is a basic premise of Marxist models in household archaeology, but this differs from processual models of social complexity. In contrast to the classic Marxist classification of pre-urban households as egalitarian, many of the Neo-Marxist models embraced the idea of ephemeral inequality based on the ever-changing pattern of cycles of household growth and decline (Godelier 1975; Goody 1958; Meillassoux 1978). Inequalities that result from differences in the cycles of demographic and economic evolution may be hard to define but are nevertheless very real. Thus, at any one time, the households of a settlement will demonstrate differences in membership, the composition of the labor force, and the structure of dominance within the co-resident group and within the settlement as a whole (Moore 1986). They will demonstrate differences in relations with groups outside the village and, most importantly, differences in access to the products and processes of production. This concept of small-scale social inequality is the basis of a number of archaeological models that use the emerging importance of households as the unit of social reproduction to explain larger social and economic transformations, such as the intensification of production, the increase of the labor supply, and the increase in cultural complexity, even urbanism (Frankel and Webb 2006; Tringham 1990a). For example, fig. 2 is a chart to show the change in household structure during the Neolithic-Eneolithic period in Southeast Europe. The chart was originally created for the publication of the Neolithic village of Selevac (see below) (Tringham 1990a) to show the change from large settlements formed of aggregated households acting as the unit of social reproduction (such as Selevac) to later Neolithic small settlements (such as at Opovo) that were formed of isolated or a couple of households, interpreted in this case as junior households escaping from the strictures of the senior households in aggregated settlements. The Early Bronze Age takes this process of decentralization even further, still—it is hypothesized—with households acting independently. Amidst all the changes in household relations and status, the intensification of production continued to be driven by the contradictions generated by small-scale inequalities between households with differentiating access to production and exchange.

Post-Processual Archaeologies

The archaeologists who have contributed most to sustaining interest in household archaeology and drawing it out of its position on the periphery of the discipline have been those exploring the practice of feminist anthropology and theories of social practice whose standpoints come under the multicolored umbrella of post-processual and/or interpretive archaeology. These standpoints were not at all reflected in my initial presentation at the "Women and Production in Prehistory" conference of April 1988 (Gero and Conkey 1991). In spite of being inspired at this conference to change direction toward the feminist critique of archaeology (Tringham 1991: 93), this standpoint continued to be unacknowledged in my plenary address at the Chacmool conference on "Households and Communities" in November 1988 (MacEachern et al. 1989). Nor, for that matter, is it reflected in the concluding chapter of the Selevac project report (see below), written in 1989, that focuses on household archaeology (Tringham 1990a). By 1991, however, with Meg Conkey as my colleague at U.C. Berkeley, with the publication of the "Women and Production in Prehistory" conference, I embraced the epistemology of the feminist critique of science, narrative as a legitimate format of presentation, a focus on life-histories of people, places, and things, and most importantly households with "faces" (Tringham 1991, 1994). My most recent exploration of recombinant histories and database narratives, building on rather than rejecting previous standpoints, is discussed at the end of this chapter, since it results from the development of the digital window on household archaeology since 1991.

A common theme of these diverse post-structural theories has been their development—especially in cultural geography and social anthropology—beyond Neo-Marxist models of power and labor control to models that focus on the contexts of daily practice in domestic arenas as being the most significant places. Here, negotiations take place within and between the house to construct, maintain, and transform ideologies of gender, class, labor, production, and identity (Cresswell 2004; de Certeau 1984; Massey 1994; Smith 2004; Thrift 1996). They challenge the search for the universal category of "kin-based co-residential domestic group" and embrace the richness of the diversity of the social context of domestic action. They lift the household domain out of its previous position of assumed general knowledge and as marginal to the great events of history. They provide a richly based, multiscalar theoretical framework to consider the role of the labor of players in prehistory: women, men, and children.

To paraphrase—and slightly embellish—what I wrote in 2001 (Tringham 2001: 6928), at the beginning of the twenty-first century, "what households do" is still a focus of household archaeology, but the "doing" is far more complex than physical action, comprising events and tasks that involve movement and embodiment, repetition and habituation, by people with faces, within a context of other players and the construction of place (Ingold 2000).

The Practice of Household Archaeology

There have been many changes in the standard practices of investigating households, some of which are enabled, improved, or made easier by digital technologies. This conference has shown the multitude of ways in which information is being squeezed out of the archaeological remains. Many of the methods have only come to be used more commonly because of changes in the theoretical attitudes to the challenge of investigating households. For example, investigations of the use-life of artifacts grew out of an interest in site formation processes, itself a product of the need for middle-range research (Schiffer 1976). The speedy extension to include architecture, however, which had not been part of the original site-formation processes suite, developed, I believe, as a direct result of the methodological requirements for household archaeology (McGuire and Schiffer 1983). We have all experienced changes in our favored mode of investigation. In some cases, the change might be the result of a deliberate development of a methodology inspired by new questions, as with our development of a strategy to investigate the destruction of houses by fire; but in other cases, it might be more a case of serendipitously falling into an investigative strategy that is already in use by others, such as our adoption in the BACH area at Çatalhöyük to adopt the micro-archaeology methodologies of prehistoric buildings.

Our choice of strategies for investigation is partially dependent on the archaeological, logistical, social, and political contexts in which we practice household archaeology and the extent to which the practice of different methodologies has been hindered or enabled and encouraged. What follows is not a general history about digital technology and household archaeology in which my own experiences can be treated as examples or case-studies from which to extrapolate the whole. Instead, this chapter is something of a personal exploration of my own encounters with the practice of investigating household archaeology. Later on, I will discuss the construction of recombinant histories. At this point in the essay, however, I would like to draw attention to the fact that this exploration is itself a recombinant history, comprising a series of fragments from my own experience that, taken together, create a story about this theme that revolves around four places, four different periods in my life, four different periods in the history of household archaeology, and four very different contexts of work, social practice, and history.

Sites of Investigation *(fig. 3)*

Southeastern Europe

Three of the places are located in southeastern Europe. The projects all investigate the establishment of early agricultural (Late Neolithic/Early Chalcolithic) villages in the 5th–4th millennia B.C.E.

Selevac. The project at Selevac, near Smederevska Palanka in the heart of Serbia (former Yugoslavia), was my first experience in directing an archaeological project. The National Science Foundation funded three field seasons (1976–1978) and a couple of subsequent study seasons. Thus, the first field season coincided with the publication of Flannery's (1976) "Early Mesoamerican Village." Neither household archaeology nor architecture, however, figured in the excavation strategy of my project, which was designed more to study the intensification of production and sedentism by focusing on artifactual materials and relatively coarse-grained stratigraphy. Constructing the use-lives of flaked stone, ground stone, and ceramics through Middle Range theory played a large part in the research strategy (fig. 4), building on my research and teaching at Harvard University in contact traces (microwear) (Tringham 1978, 1990b) and the fact that two project participants had been students of Michael Schiffer (Cheryl Claassen and Carol Spears).

The publication of the project spanned the 1980s, with final production of the monograph in 1990 (Tringham and Krstic 1990). By this time, I had become interested in the use-life of buildings and the investigation of architectural remains

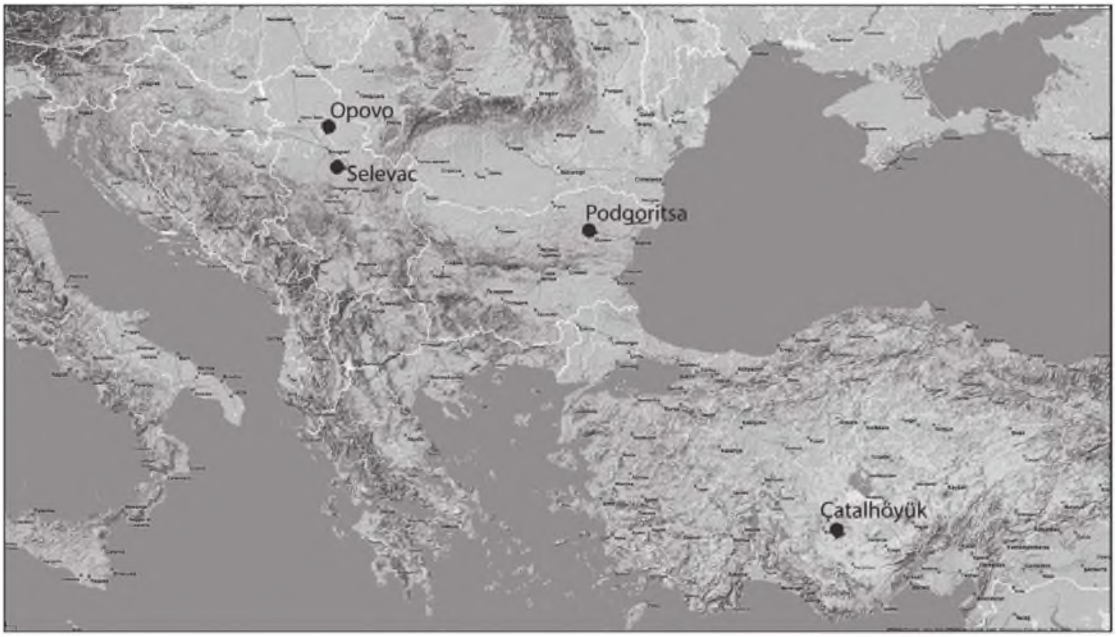

Fig. 3. Map showing the of sites of investigation in this exploration of household archaeology.

during the project at Opovo (following section), setting these investigations in the theoretical framework of household archaeology. As can be seen from the concluding chapter of the Selevac monograph, the 1970s excavation results were retrospectively placed firmly in a model that integrated the transformation of Neolithic communities of southeastern Europe through the combined effect of increasing sedentism, intensification of production, and the emergence of the household as an independent unit of social reproduction, assuring the resistance to urban development for several thousand years to come in this area (Tringham 1990a). The Selevac monograph may definitely be classified as an example of history writ large.

Opovo. As became a pattern in my career (not one to be emulated), the project at Opovo, located in the lower Tisza-Tamiş valleys of the area of Serbia known as Vojvodina, began while the analysis and publication of Selevac was still in process. This project was designed as a response to my growing interest in the study of prehistoric architecture, to incorporate the details of a building's destruction and abandonment as well as its construction. This also became the focus of the career of my Serbian collaborator, Mirjana Stevanović, who had been a student participant at Selevac and with whom I directed excavations from then on. Together we devised a strategy to excavate the use-lives of Neolithic burned wattle-and-daub houses of southeastern Europe and put this strategy into practice at Opovo between 1983 and 1989 (Tringham et al. 1985, 1992). Many of our team members at Opovo had also participated in the project at Selevac. Our Yugoslav co-director was Bogdan Brukner, who directed the Neolithic excavations at the large-scale project at Gomolava. The Opovo project, in sharp contrast to that of Selevac, exposed a large area (16 × 20 m) with several partially superimposed complete houses (fig. 5). Also, unlike the Selevac

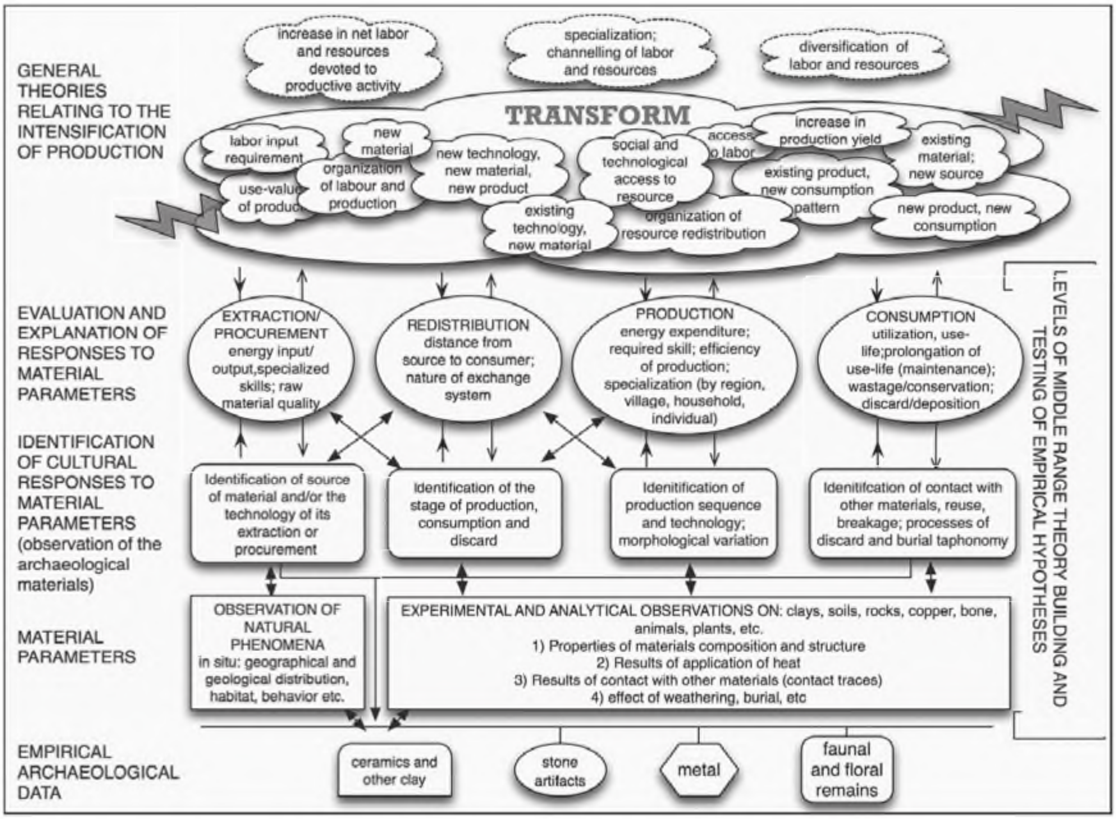
GENERAL THEORIES RELATING TO THE INTENSIFICATION OF PRODUCTION
increase in net labor and resources devoted to productive activity
specialization; channelling of labor and resources
diversification of labor and resources
TRANSFORM
labor input requirement
new material
use-valu of produc
organization of labour and production
new technology, new material, new product
existing technology, new material
social and technological access to resource
access o labor
organization of resource redistribution
increase in production yield
existing product, new consumption pattern
existing material; new source
new product, new consumption
EVALUATION AND EXPLANATION OF RESPONSES TO MATERIAL PARAMETERS
EXTRACTION/ PROCUREMENT energy input/ output,specialized skills; raw material quality
REDISTRIBUTION distance from source to consumer; nature of exchange system
PRODUCTION energy expenditure; required skill; efficiency of production; specialization (by region, village, household, individual)
CONSUMPTION utilization, use-life;prolongation of use-life (maintenance); wastage/conservation; discard/deposition
IDENTIFICATION OF CULTURAL RESPONSES TO MATERIAL PARAMETERS (observation of the archaeological materials)
Identification of source of material and/or the technology of its extraction or procurement
Identification of the stage of production, consumption and discard
Idenitification of production sequence and technology; morphological variation
Idenitifcation of contact with other materials, reuse, breakage; processes of discard and burial taphonomy
MATERIAL PARAMETERS
OBSERVATION OF NATURAL PHENOMENA in situ: geographical and geological distribution, habitat, behavior etc.
EXPERIMENTAL AND ANALYTICAL OBSERVATIONS ON: clays, soils, rocks, copper, bone, animals, plants, etc.
1) Properties of materials composition and structure
2) Results of application of heat
3) Results of contact with other materials (contact traces)
4) effect of weathering, burial, etc
EMPIRICAL ARCHAEOLOGICAL DATA
ceramics and other clay
stone artifacts
metal
faunal and floral remains
LEVELS OF MIDDLE RANGE THEORY BUILDING AND TESTING OF EMPIRICAL HYPOTHESES

Fig. 4. Research design incorporating Middle Range theory-building used in the Selevac project and later in the Opovo project (based on Tringham and Krstic 1990: figs. 1.5, 16.10, 16.11).

project, the Opovo project was not funded by a steady stream of "hard" currency and was constantly beset by the financial hardship cause by the growing inflation of the Yugoslav dinar. In the end, inflation along with a host of related economic, social, and political crises erupted with the Yugoslav Civil War in 1991. Thus, the project finished just before civil war. By the time of the Opovo project, I was on the anthropology faculty at University of California, Berkeley and had access to the support of that institution's Quantitative Anthropology Laboratory.

The project at Opovo was an ambitious enterprise to put household archaeology into practice, but this was a household archaeology that was heavily steeped in Neo-Marxist theoretical models of small-scale ephemeral inequality in production and access to resources between households. We made the assumption that each building at the site represented a single household. Thus we studied the use-lives of artifacts—the total range of production information from resource procurement to deposition as archaeological record—in relation to their context in the use-lives of the buildings. The Opovo project is probably most famous for its investigation of the "Burned House Horizon" of Neolithic Southeast Europe. From the results of our investigation, we extrapolated to the regional scale of southeast European Neolithic settlements that houses were regularly burned deliberately as separate events at the

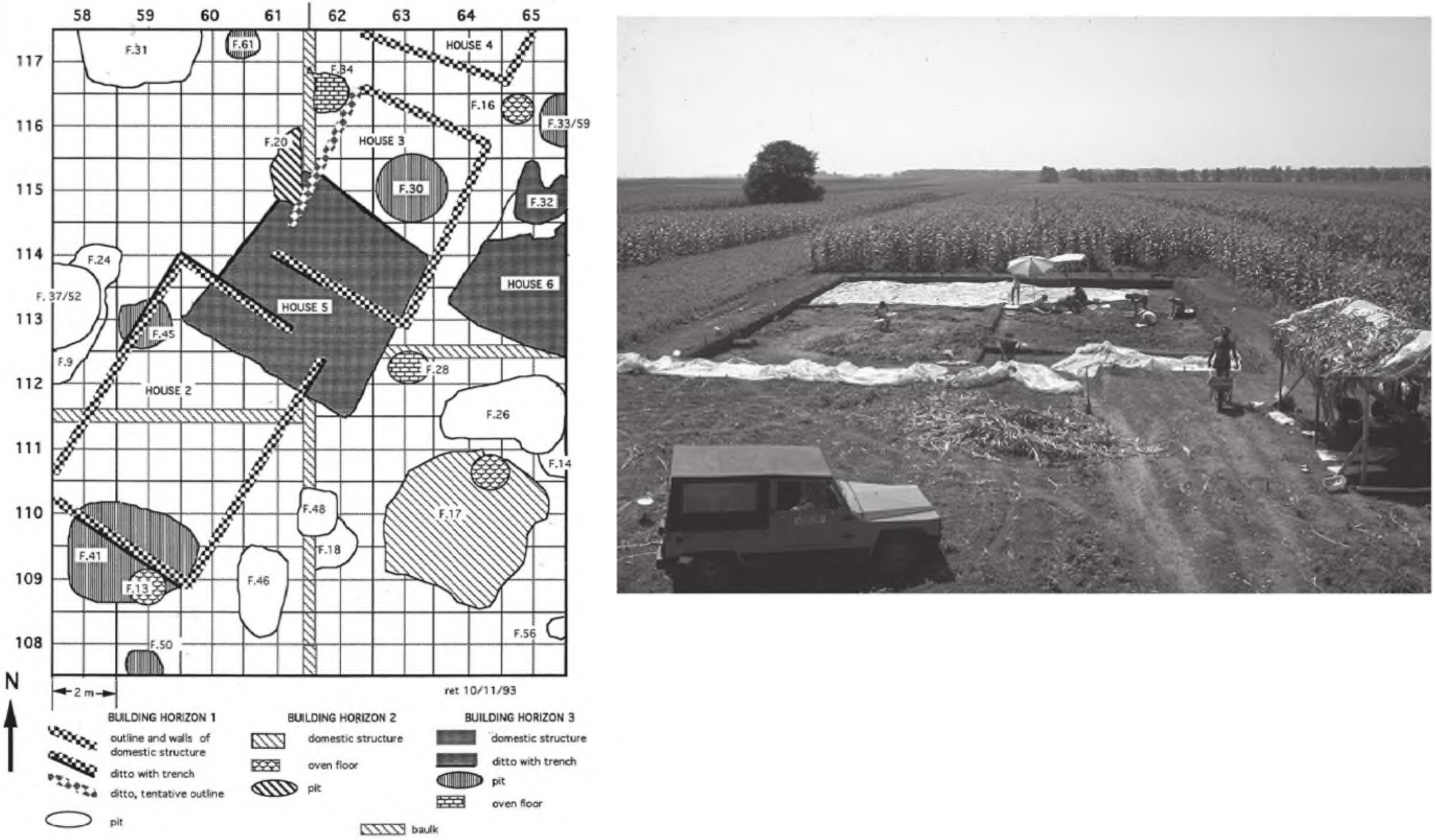

Fig. 5. Plan and photo of the excavated houses at Opovo (after Tringham et al. 1992: fig. 9).

end of their use-lives. Our favorite interpretation of these data was that houses were burned to create a permanent (if invisible sub-surface) marker of the house on the landscape, contributing to the continuity of place and social memory (Stevanovic 1997, 2002; Stevanovic and Tringham 1998; Tringham 1994, 2000, 2005). In terms of the study of household inequality, however, our sample of three complete and two partial houses was far from ideal for the purposes of statistical evaluation and extrapolation to the settlement as a whole.

Podgoritsa. True to pattern, I was tempted, while editing and writing the final report of Opovo, to join Douglass Bailey in a proposed project in Northeast Bulgaria to do a household archaeology study of a small Eneolithic (4400–4600 B.C.E.; Polyanitsa Culture) settlement mound ("tell") at Podgoritsa. Douglass had also been writing about the life-history of houses, specifically on tell settlements in Bulgaria (Bailey 1990). He suggested that, linked to the developments in production and settlement complexity, the Eneolithic period is characterized by an intensification of the expression of personal and group identity (Bailey 1996).

The National Science Foundation funded the single season of fieldwork in summer 1995 carried out by a combined team of Bulgarian, American, and British archaeologists and geophysicists (Bailey et al. 1998). The team included a number of former participants in the Opovo project, including Mirjana Stevanović and Nerissa Russell. Michael Ashley, whose name will recur frequently as I discuss the digital window, was also a member of the team. Mirjana and I hoped to apply here much of the strategy that we had developed in Yugoslavia to investigate household archaeology and the use-lives of buildings. At Podgoritsa, the core of the methodology for excavating and recording the houses was structured to test (and challenge) the validity of the assumed synchronicity and coherence of the building horizon concept (Tringham 2000). An important expansion of our research in Yugoslavia was that in Podgoritsa we expected to find more or less vertically superimposed sequences of buildings that would make an important contribution to understanding the role of households in the formation of tell settlements (Tringham 2000). Unfortunately, we did not succeed in going below the uppermost level of houses before terminating the project.

Anatolia: Çatalhöyük

Tells had comprised the focus of our research into early agricultural settlements in Bulgaria where, in contrast to Yugoslavia and other West Balkan regions, they formed from the Early Neolithic to Early Bronze Age. Similarly, Anatolian prehistoric studies have been dominated by fieldwork on tell settlements. One of the most famous (and largest) of these is Çatalhöyük, a 9,000-year-old Neolithic settlement that was occupied for 1,400 years in the Konya region of Turkey. In both areas, it has been traditionally suggested that tells formed because they played an important role in the dynamics of increased large-scale agricultural and material production as well as expressions of group identity. Ian Hodder obtained permission to renew research at Çatalhöyük in 1993 (Balter 2005; Hodder 2006) to make these traditional descriptions of tell settlements objects of investigation rather than taken-for-granted facts. With his standpoint firmly in the practice theory of Post-Processual Archaeology, his strategy of research was to understand the formation of the tell as a complex organic evolution of building units, which may or may not (depending on the data) equate with a network of individual households. It was household archaeology in everything but name.

After the demise of the Podgoritsa project, several of the team members went on to join the first season of excavation at Çatalhöyük in 1995. I had already refused an invitation to join the Çatalhöyük team, being committed, I thought, to working in southeastern Europe. In 1996, however, I accepted an invitation to visit the site to plan a collaborative project to investigate the life-history of a specific building (Building 3) in the context of neighboring houses on the peak at the northern end of the East Mound. The project, known as Berkeley Archaeologists @ Çatalhöyük (BACH), began in 1997 under the umbrella of the main Çatalhöyük Research Project (CRP) with a team from the U.S.A., Serbia, U.K., and Turkey. The excavation of Building 3 lasted until 2003, by which time all its walls, floors, and features had been removed. The project was funded by the National Science Foundation through 2000, after which it was funded by small grants and private gifts (Tringham and Stevanovic 2012).

There were a number of factors that made this project very different from those I had conducted in southeastern Europe and much more conducive to a successful investigation of household archaeology. There was already in place an interdisciplinary team of the CRP who were prepared to integrate our and their results as a multivocal enterprise. Their research aims were in line with ours in terms of constructing life-histories of people, places, and things at multiple scales. Their collaboration broadened the spatial exposure of excavated buildings in a way that could not be done by a single project. The mud-brick architecture is not only well preserved, but, unlike wattle-and-daub architecture, enables an archaeologist to follow in rich detail the sequence of modifications to a building during its life (Tringham and Stevanovic 2012b). A monograph—*Last House on the Hill*—comprises the final paper published report of the BACH project.[1]

Changing Methods of Investigation

A surprising number of methods of investigation have been technologically accessible for many years (often decades) before they were actually applied to archaeological investigation. Many of them are improved by, but do not require, electronic technology or digital formats of retrieval, presentation, and archiving. As mentioned earlier, I believe it is the questions that we ask as archaeologists that will drive the adoption of new methods rather than the "wow" factor of the techniques themselves.[2]

Artifacts

Inequalities within and between domestic units—households—are manifested archaeologically by the spatial differentiation of the production process, that is, in the production, consumption, and distribution of food and nonfood resources. In each case the pattern of economic activity (and inequality) should have a distinctive appearance, demonstrating differential access to the materials, means, process, and products of production. The expectation is that different households will show differential access not only to the products of exchange with other groups but also to the raw materials, techniques, and equipment for making use of resources, such as food items, minerals, and ceramics. Such a differentiation of economic activity is frequently, but not necessarily, accompanied by specific styles of material.

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[1] R. Tringham and M. Stevanovic (eds.), *Last House on the Hill: BACH Area Reports from Çatalhöyük, Turkey.* Çatalhöyük 11. Monumenta Archaeologica 27. Los Angeles: Cotsen Institute of Archaeology.

[2] As a matter of fact, Meg Conkey and I made this same point in a paper entitled "European Theoretical/Social Archaeology: Studies in Ambiguity" presented in a symposium "Trowel and Error" at the Annual Meeting of the Society for American Archaeology at Phoenix, AR (May, 1988), much to the chagrin of chair T. Douglas Price.

Spatial and Activity Area Analysis. The 2D and 3D plotting of individual artifacts and/or their clusters on floors and surfaces had been a significant strategy for the documentation of excavations since the 1930s characterized by large horizontal exposure with or (especially) without stratified deposits. Early examples of such research include the excavation of Late Neolithic (Tripolye culture) settlements in the former USSR (Krichevski 1940) and investigation of the late Pleistocene hunter-gatherer settlements in Paris Basin, such as Pincevent (Leroi-Gourhan and Brézellon 1972). The aim of these excavations was, as with Flannery's Oaxaca excavations and many others since, to identify activity areas, representing specialized activities such as hide-cleaning or bead-making, or unspecialized areas of domestic chores such as cooking. The ultimate aim of most of these studies was to extrapolate from the sample to provide broadly applicable information on ecological adaptation and cultural complexity. Later examples have added larger samples of materials beyond diagnostic pieces and more complex statistical manipulation (Kent 1990).

Use-life. It was unusual (and perhaps still is) until the late 1970s for such plotted distributions to include information on all stages of use-life. Procurement and manufacturing information was important in terms of exchange and craft specialization, but information on consumption (use), maintenance (re-use) and deposition were an untapped wealth until the studies on site formation and taphonomy were brought into view by Middle Range Theory-building (Binford 1977; Schiffer 1976; Tringham 1978). Contact trace experimentation and analysis of microwear and residues played an important part in these developments.

Artifact investigation at Selevac in the late 1970s took place in the middle of these developments in the discipline. My emphasis at this time was monitoring changing resource use through time with a view to investigating sedentism and the intensification of production, so that spatial exposure across the site and identification of activity areas was very limited. All artifacts, however, whether lithics, groundstone, ceramics, bone and antler were subjected to use-life analysis, in most cases based on preceding experimental research (Tringham 1978, 1990b).

Architecture

Unlike artifacts, archaeological architecture was not subjected to such Middle Range research as use-life analysis until the 1980s (1983–84; McGuire and Schiffer 1983; Stevanovic 1997; Tringham 1994).[3] There is no doubt in my mind that its inclusion in such studies was the new interest in household archaeology in the early 1980s.

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[3] Both Mirjana Stevanović and I presented the idea—taking off from the McGuire and Schiffer (1983) article—at the Society for American Archaeology and American Anthropological Association 1984 annual meetings respectively.

The built environment provides the essential context of co-resident domestic groups. So it is not surprising that archaeologists interested in architecture and working in well preserved architectural contexts have led the field of household archaeology. Our premise when beginning the work at Opovo, for example, was that the primary requirement for the examination of the social context of production and economic life at an archaeological site (in other words, of household archaeology) is that a number of domestic architectural units be exposed by excavation. This would enable a comparative view of co-resident domestic groups across the settlement at any one time. Large architectural exposure has also facilitated the construction of neighborhoods, specialized areas, and pathways (see Frankel and Webb 2006, Chapter 18; Hodder 2006, Nishimura, Chapter 14).

The study of archaeological architecture in terms of the use-life of buildings greatly enhanced these efforts. In this way the context and nature of the construction, maintenance, occupation, modification, and abandonment, destruction, and replacement of a residence all become objects of investigation. Traditionally, they would have comprised elements that were subsumed under the formal description of the building. The investigation of a building through different stages of its use-life, however, brings to light many important aspects that would otherwise have been ignored; for example, modifications such as the addition or removal of rooms during the cycle of growth and decline of a domestic unit, efforts to prolong the use-life of a building by repairs and renewals, symbolic emphasis placed on particular use-life stages such as re-plastering, the destruction of old houses (for example by fire), or founding of new houses (Steadman 1996; Stevanovic 2012a; Stevanovic and Tringham 1998).

Architecture at Opovo in the 1980s was treated as the dynamic context of households that were in a constant flux in terms of their status in the village, drawing on the Neo-Marxist models of inequality between households. Artifactual analysis proceeded along the same lines of use-life analysis as at Selevac. The architectural remains were also subjected to use-life analysis described above. Mirjana Stevanovic (1997) and I were especially interested in the phenomenon that we referred to as the "Burned House Horizon" (BHH), in which all the houses surviving archaeologically in southeast European Neolithic and Eneolithic ended their days in a high temperature fire. Interestingly our investigation supported the idea of households in the BHH acting as independent units of social reproduction in that we determined—at least in the Opovo excavation—that each fire was deliberately set as an independent conflagration (Stevanovic 1997; Tringham 1994). After the project, our interpretations of this information varied, including a means to ensure continued knowledge of the location of "dead" houses, symbolic funeral pyre for a household, and so on (Chapman 1999; Stevanovic 2002; Tringham 2000, 2005). This was household archaeology practiced "without faces," but post-excavation incorporation of faces (see below) was founded on an extraordinarily detailed architectural investigation of the use-lives of five wattle-and-daub houses.

The Harris Matrix is a good example of one those tools that has been around for many years, needs no complicated equipment, but has only recently begun to be incorporated into mainstream excavation practice as an extraordinarily useful tool. It was developed by Edward Harris at Winchester, UK in 1973, and was adopted in Britain by a number of urban archaeology projects, where it has become standard

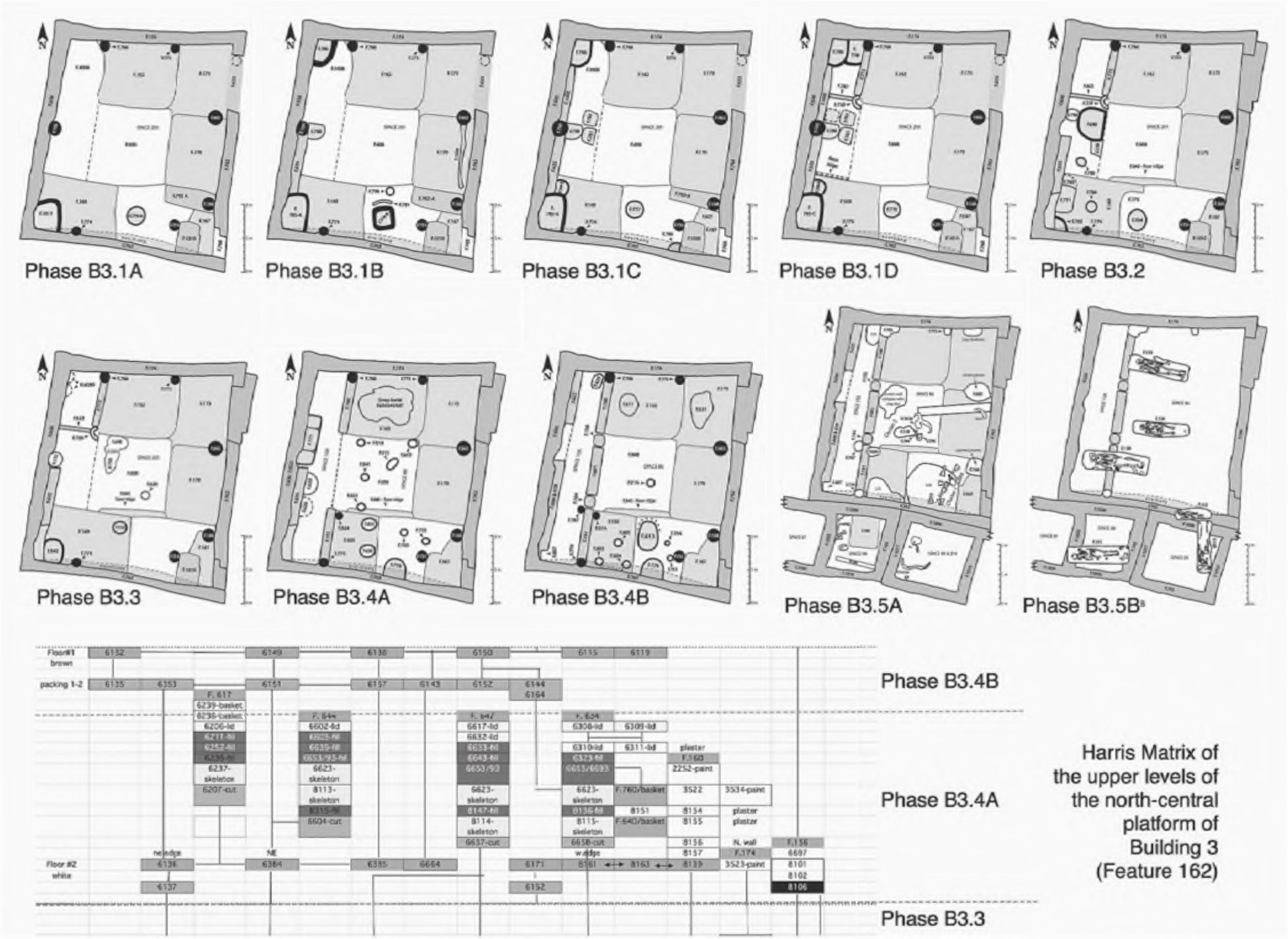

Fig. 6. Household investigation in the excavation of Building 3 at Catalhöyük: (a) use-life phases; (b) Harris matrix of platform F.162.

procedure. It has also found popularity in archaeological projects in Europe and the Near East (Harris 1979, 1998). However, it has been resisted as standard procedure in North America, except on Historical Archaeological projects. As a method of depicting the stratigraphic position of each depositional event in the process of the changing life of a building or a location, the Harris Matrix has played a fundamental role in documenting the complexities and details necessary for household archaeology to work successfully. It is, however, dependent on a strategy of excavation (single-context excavation) in which each depositional event is recorded as a unique context or unit, along with its associated finds and samples. Ideally, each context should be excavated in the reverse order to that in which it was created, according to its "natural stratigraphy,"—that is, without using baulks and arbitrary spits. This restriction might explain its lack of general adoption on prehistoric sites, especially places with no clear architecture. At Opovo, we did excavate to a certain extent in single contexts, but we did not use the Harris Matrix to present our stratigraphy.

Architecture at Çatalhöyük survived with its plastered mud bricks and plastered clay floors and features in a much better state than the burned clay rubble of Opovo. This fact certainly contributed to the feasibility of a single-context excavation strategy and its representation in a Harris Matrix (fig. 6a–b). An important factor, however, was the ability of this strategy of excavation and documentation to represent the complex process of interweaving the history of people, places, and things within the formation of the settlement mound, providing data for post-processual questions of everyday practices within the house (Hodder et al. 2007; Stevanovic 2012a; Tringham and Stevanovic 2012).

Repeated Practices and Microarchaeology

An important shift in the treatment of, and thinking about, architectural remains within the framework of household archaeology has been a growing emphasis on the life-history of buildings rather than their use-life (Tringham 1994). This means that the biography of a house is inextricably linked to the biographies of the people who lived in and walked through the building. The everyday practices of these members of the household comprised rhythms of tasks that were unique events in the history of that place. Such multiscalar historically contingent places focus the archaeologists' attention on dramas and events that went on within the household, inequalities and communication between its members as they went about their daily tasks. Thus, as I discussed above, this changing nature of household archaeology demands for a detail of retrieval of data on everyday practices—microarchaeology—that could have been carried out earlier but never was, simply because there was no demand for the expenditure of time and funds needed in this kind of highly detailed work.

Microstratigraphy/micromorphology is one such source of the detailed information. Microstratigraphic observations and sampling combined with micromorphological analysis provides the key to addressing the detailed record of everyday practice. The analysis of the samples includes a detailed examination of the depositional and contextual relationship between "natural" and constructional and other anthropogenic sediments, artifacts, and inorganic and organic remains, and eventually the identification of the processes of deposition and post-depositional alterations. These techniques were developed in the 1960s by archaeologists analyzing

Pleistocene and early Holocene deposits in caves. Their use on other kinds of archaeological sites has, until recently, been quite rare and generally without a regular on-site micromorphologist (Courty et al. 1990). With the increased interest in the detailed life-history of individual buildings that cannot be reconstructed without these observations, the incorporation of micromorphologists in excavation teams has become more frequent, one of the best examples being Çatalhöyük (Boivin 2000; Courty et al. 1990; Matthews 2005a, 2012; Rosen 1993).

Microartifactual distribution differs from the spatial distribution of artifacts mentioned above in relation to activity areas in that the data is not clearly visible as artifactual and is not plotted individually. The source of the data is the heavy residue by-product of flotation samples—debris including microfauna, charcoal, shell, insects, eggshell, micro-debitage of lithics, figurines, and beads, dung, plant materials, coprolite fragments, etc.—that provides information on in situ tasks and actions in and around a building in contexts where floors and features have been stripped or cleaned prior to replastering or closure and abandonment, leaving very little macroartifactual data for retrieval. Flotation samples in many cases provide the most standardized—and often ubiquitous—data set across a site (Matthews and Hastorf 2000). Since they are so closely tied to depositional events, their heavy residue content provides essential information on the significance of changing spatial configuration within a building through time. They also provide information on repeated associations of task-specific debris, from which conclusions on rules about specialized areas of buildings may be drawn (Rosen 1993). The success of the microartifactual distribution analysis is dependent on computational statistical evaluation and even incorporation into a GIS mapping program (Ullah, chap. 5 below). These have, however, been around for much longer than the application of these observations.

Microarchaeology and repeated practices at Çatalhöyük. Microstratigraphic excavation and observations and intensive sampling from building floors, plasters, and walls for micromorphological analysis was a characteristic of the Çatalhöyük Research Project from its inception in 1993, under the leadership of Wendy Matthews, who played an important role in the design and implementation of its research program, as well as training in the field (Matthews 2005a, 2005b, 2012; Matthews et al. 1996; Tung 2008). Arlene Rosen, who wrote one of the first books in which micromorphology was applied to Holocene archaeology, was also a member of the CRP team. She started a program of systematic sampling for phytoliths at the site (Rosen 2005), which complemented the systematic sampling for geochemical residues of various kinds on the floors (Middleton et al. 2005). The intensity with which the floors and buildings at Çatalhöyük have been sampled is very time-consuming and expensive but has paid off in the extraordinary results that have been gained about the life-histories of buildings at the site (Hodder and Cessford 2004).

In the publications of the 1995–1999 excavations at Çatalhöyük, it was pointed out that, although the analyses of sampled sets—including those just described—contributed to knowledge about the Neolithic houses in terms of the tasks, activities, and repetitive practices that were carried out, the analyses of the heavy residues from the ubiquitous flotation samples in their architectural contexts made the greatest contribution to understanding their spatial patterning (Cessford 2003; Cessford and Mitrovic 2005; May 2005).

Household Archaeology in the Context of Digital Technology

I have chosen to focus much of this chapter on one aspect of household archaeology that has interested me personally and increasingly in the last 15 years: the transformations that have been created in the field of household archaeology by the accelerating developments of digital technology. I believe, moreover, (and hope to show by the end of this chapter) that these and future developments in digital technology hold the key to breathing life into the topic of household archaeology. The extraordinary trajectory of computerized technology, digital formats of publication, knowledge production through search engines, and communication via the Internet has transformed our lives and the way we practice archaeology with such speed that it is possible to trace these transformations within the professional career of a single person who is still actively participating in those transformations (Tringham 2010).[4] I am obviously describing myself here, but the experience must have been repeated for many other archaeologists. What I think is important, and I shall try to express here, is that archaeological projects themselves and the fate of their data and archives have also been participants in these transformations.

In this section of the essay I have selected certain domains of digital technology that have come in and out of popularity. Actually, they were hailed at first as innovations that would solve all our problems in archaeology but gradually became invisible and taken for granted through habituation. Digital technology in archaeology started with quantification and statistical manipulation, followed by digital formats of documentation and mapping, and then followed on to the wonders of 3D and the creation of virtual immersive environments, and finally the ubiquity of the Internet releasing us to enjoy the immediate satisfaction of communication anywhere, anytime, globally. In this parade of innovations, there are certain constant elements whose transformations are worth bearing in mind (this list is not expected to be definitive!):

Input of content into the digital format. The advent of the personal computer in the late 1970s—and for me the joyful visual interface of the Apple Macintosh in 1984—freed the general public from the logistical inconvenience and tyranny (but also expertise, security, and responsibility) of the computer specialists. The platform through which we interface with the digital world is also an important consideration: Unix, Linux, MS Windows, AppleOS. Speed and processing power of the computers has made a huge difference in who can do what, and all of this comes down to the price of hardware.

The software producers keep us in thrall to their updates and upgrades, which are a sign of progress but also come at a price. Proprietary software is challenged by the ever-growing availability of open-source software, often free or less expensive.

Storage is a volatile element (both in use and in pricing): where to put all the products of our digital activity? The size of files has grown exponentially and laughably from a maximum of 100kb in 1984 to amounts currently measured in gigabytes or terabytes. Parallel with this is the need to store these growing data either inside the computer's hard drive or in external drives or on various forms of removable media. Many of the means of connecting to external media have fallen into oblivion and, if we are not careful, those old media full of archaeological data will go the same way. Now many store their data on-line, somewhere in cyberspace (the Cloud), arguably the most secure and sustainable and also the easiest to access by a large audience.

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[4] The figures from the Tringham (2010) article—most of which are relevant to this part of this chapter—are reproduced in low resolution format at the following web-site: http://www.ruthtringham.com/Ruth_Tringham/DigitalDocumentation.html.

Input devices by which the data can be captured, in addition to the mouse (not introduced until the 1980s) and keyboard, include scanners, various kinds of laser input devices, filmless still cameras whose quality now equals at an affordable price that of film cameras, and video cameras, some of which are filmless as well as tiny and affordable. The BACH project is just one that was transformed by these developments (Tringham and Ashley 2012a)

The Internet was already being used by universities in the 1980s but only came into its own with the establishment of the World Wide Web browser in 1994; the path to a revolution in global communication and information-sharing was set (Okin 2004). Recent aspects of the revolution include enormously powerful search engines in common usage, ubiquitous communication through "social software," and accessible on-line databases through a browser interface.

Sharing the products of computer work has changed and remains among the hardest aspects for an unguided person to handle. Printing on paper—a hard copy—is still demanded by many for reasons of "security." Digital publication is now being seen less of a challenge to the publication houses who are tending to "join the enemy." Digital publication of on-line materials is still fraught with the same intellectual property issues as copying printed works. The barriers to sharing of digital works, however, is at least being problematized by the establishment of such licensing as Creative Commons "some rights reserved,"[5] open source,[6] and the open knowledge initiative.[7] The argument here is that while recognizing the importance of acknowledging authorship, without the ability to share and re-use, digital data will not survive.

Related to sharing is the growing need for standards of documentation of digital works and the responsibility of authors to format their works for long-term durability (using non-proprietary formats). Every work needs to be embedded with information about who, how, and when the piece was created and modified—metadata—in order to guarantee its long-term sustainability (Ashley 2008; Kansa 2005; Richards 2004, 2006).[8]

Underlying all of these constant elements is one that is often overlooked—the socioeconomic, sociocultural, and sociopolitical dimensions of using, adopting, rejecting, and creating digital technologies and products. Global inequality in access to the Internet, for example, as well as computer hardware and software is an important aspect that has to be considered in a project going entirely digital. Another significant aspect, at least in academia, is the low value that has traditionally been given to digital publication compared to the definitive nature of paper publication. This has led to a lack of motivation for many academics both young and old for exploring digital authoring.

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[5] Creative Commons: http://creativecommons.org/about/ (accessed 06/30/12).

[6] For example, The Open Source Geospatial Foundation: http://www.osgeo.org/home (accessed 06/30/12).

[7] For example,The Open Knowledge Foundation: http://www.okfn.org/about (accessed 06/30/12).

[8] See also the "Digging Digitally" blog: http://www.alexandriaarchive.org/blog/?page_id=4 (accessed 06/30/12); "Open Archaeology" blog: http://thehumanjourney.net/index.php?option=com_content&task=view&id=128&Itemid=141 (accessed 06/30/12).

Numbers

My experience with the use of computers started in the 1960s as a student participant in the excavation of the Neolithic (Linear Pottery culture) settlement of Bylany, Czechoslovakia, when I was introduced to the wonders of a card-punching machine for analyzing pottery decoration (Tringham 2010). I had a closer contact with punched cards as a lithic specialist at the Yugoslav-U.S. project to excavate the Neolithic site of Divostin between 1969 and 1972. My participation in this project spanned my move to the United States. I was invited by the director Alan McPherron to visit his team in Pittsburgh, where we entered the card data into the mainframe computer and nursed through the manipulation of their numbers with complex statistical analyses. The quantification of the data from the Selevac project in the later 1970s was modeled on the design of the Divostin analysis. In the field, data were entered in 80-column sheets. The field sheets were transferred to punch cards while I used the facilities of Harvard (1976–1978); punch cards were abandoned in favor of direct data entry and tape storage when I moved to U.C. Berkeley and took advantage of the small mainframe computer of the Quantitative Anthropology Lab (QAL). Thus, the gap between field practice and digital record was beginning to close. However, the digitized data were mostly numeric and were stored in a mainframe computer; it had to be manipulated by what I considered highly unfriendly Unix commands. There was no possibility of linking the alphanumeric data to any visual record. The photographs from Selevac were not digitized until the 1990s.

Digital Documentation

The introduction of the Macintosh personal computer in 1984, with its graphical user interface, was a revolution for me. It coincided with my second season at Opovo, and I took my new Mac into the field the following year, using it to update a daily map of the excavation with the drawing program MacDraft and creating a simple database with Filevision (a precursor of Filemaker) to link the spatial data to information about the contents of units and method of excavation. For heavy-duty digital recording, however, we still relied on the 80-column sheets that were entered into the mainframe database in QAL at Berkeley. Gradually, however, in the later 1980s we started to transpose some of this data to personal databases in Excel and Filemaker. Thus, the PC revolution allowed the archaeologist during the 1980s gradually to control and explore their data in the lab and in the field. In addition to creating drawings and maps, it had a huge impact on writing records, field diaries, letters, and grant proposals, so that typewriters eventually became obsolete.

Flatbed scanners in the late 1980s started a different revolution: the capture of photographic images. But it was a relatively long journey from that point to photographs that are "born digital," that is, recorded with digital cameras, and even longer for digital video recording. Neither of these revolutions were part of the Selevac, Opovo, or Podgoritsa field research. In these projects, the capture of images was, therefore, highly selective and generally only of strictly professional subjects. When one compares digital photographic and videographic record of those projects with that of the BACH project at Çatalhöyük (where photography was exclusively digital by 2000), the increase in visual information is significant: much greater detail, range of subject documented, and value as a research and presentation record (Tringham and Ashley 2012a). Examples of less traditional subjects include time-lapse records, the practice of excavation and laboratory analysis, discussions, and demonstrations of the excavated area. The digital media also have embedded data about time of record, camera settings, and so on.

A third important aspect for archaeology that started in the 1980s was the availability of software to create relational databases with a graphical interface that could be kept on your desktop and transferred from one computer to another. In the early 1990s, Michael Ashley used 4thDimension database software to transfer the Opovo mainframe/Excel data to a locally running relational database. In 2001, this data was in turn transferred to a Filemaker database that could be distributed on-line. In 1995, using 4thDimension, he constructed a database for the Podgoritsa project. We were disappointed, when we joined the Çatalhöyük project in 1997, that the project database was maintained using Microsoft Access, Windows-only software. Even with the flexibility of an Intel-based Mac, this is still an inconvenience for those of us whose platform of choice is not Microsoft Windows (Wolle and Tringham 2000).

For household archaeology, with its interest in spatial intra-settlement patterning, the promise of Geographic Information Systems (GIS) in the 1980s led to disappointment for those (like myself) without access to high-end computers able to handle large amounts of data. In the 1990s, GIS desktop applications again limited those of us who did not favor the Windows platform for which the software was written. For the most part, those who took advantage of the applications investigated at regional rather than intra-settlement scales. In the Çatalhöyük Research Project, we have participated in the forefront of many aspects of digital expression, but GIS, which I believe is a crucial aspect of even the most humanistic standpoint and intimate scale of household archaeology (Curry 1998), has only recently (in 2011) been fulfilled in the project.

Immersive Digital Technologies

The development of computer-generated imagery (CGI) was motivated especially by the movie and computer games industry in the early 1990s. The potential of its application in reconstructing the fragmented archaeological record is clearly huge (Forte and Siliotti 1997). Its applications in archaeology, however, have always been out of reach of an archaeologist not trained in 3D Computer-Aided Design (CAD) software such as Alias and 3DStudioMax, as I realized from my experience with Michael Ashley and Julian Liao in creating the Opovo burning house for the Chimera Project (see below). It is a seductive idea to be able to recreate past landscapes and buildings, as can be seen in the reconstructions of Mellaart's excavated rooms in the CD-ROM *Çatal Hüyük* (Detzler and Emele 1998; Emele 1998).[9] When the 3D model allows for travel through the reconstruction—a virtual immersion—the illusion that the model is real can lead to a lack of critical awareness about the process of interpretation on the part of the viewer, unless the process is made transparent (Forte 2011; Pescarin et al. 2008; Tringham and Ashley 2007).

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[9] The CD-ROM is now unobtainable, but one of their reconstructed rooms may be viewed at: http://www.youtube.com/watch?v=tHItlksQ91g (accessed 06/30/12).

Virtual reality covers a number of formats that allow users to immerse themselves interactively in a visual three-dimensional environment. QuickTime Virtual Reality (QTVR) is an inexpensive accessible technology first distributed by Apple in 1995: an interactive virtual environment is created out of a 360° panorama of stitched images. The images may be photographs or CGI interpretive reconstructions. The interactivity is created by the user virtually standing in the center of the panorama and bringing the panorama closer or changing the viewing angle or pressing a hotspot to move into another panorama, altogether giving an illusion of moving in this place/space. QTVR is the only virtual reality application that I have used in my research, since it is an easy way give an illusion of immersion. Beginning in 1996, I and, later, Michael Ashley created a number of such panoramas at Çatalhöyük that always made a big impression at presentations of the project (Tringham and Ashley 2012a). Immersive 3D environments created out of the point cloud of a laser scan that is then given a skin from a photo is perhaps a more valuable research tool for archaeology and cultural heritage management but has generally been applied in places where there is some clear standing architecture or landscape features.[10]

True Virtual Reality models, in which a user can move through the model as in a computer game, require a very different set of technologies, accessible to computer graphics specialists, and popular with architectural historians with documents and some standing architecture.[11] Its potential in prehistoric or household archaeology has not yet been tapped.

Augmented Reality is the concept of blending (augmenting) data—information, rich media, and even live action—with what we see in the real world. It is very powerful and seductive. And until the last couple of years, it was really beyond the means of most consumers and archaeologists. Since 2008, however, the camera and screen embedded in smart phones and other mobile devices now serve as the means to combine real world data with virtual data. Using GPS capability, image recognition, and a compass, augmented reality applications can pinpoint where the mobile camera is pointing and overlay relevant information at appropriate points on the screen .[12] Virtual worlds and computer games, like augmented reality, take the illusion of immersion in a cyber-place one step further by adding avatars of real-time players who have a telepresence and can affect the environment and communicate with other players or elements in the world. With the example of the virtual world of "Second Life" we can see that virtual worlds are less about creating illusions of reality than they are about communicating and collaborating in real time (Bartle 2004; Biocca and Levy 1995). Below I describe Okapi Island in "Second Life" based on our research at Çatalhöyük.

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[10] For examples, explore the following site: http://archive.cyark.org/ (accessed 06/30/12).

[11] A number of articles related to virtual reality models? can be found in the publications on the EPOCH website: http://www.epoch-net.org/index.php?option=com_content&task=view&id=196&Itemid=302 (accessed 06/30/12).

[12] An example created by the Museum of London is the iPhone app "StreetMuseum": http://www.mymodernmet.com/profiles/blogs/streetmuseum-looking-into-the.

Hyperlinking

Hyperlinking—the ability to create nodes with links through which a user can navigate around document(s)—is a fundamental part of World Wide Web browsers using Hypertext Markup Language (HTML), developed by George Landow and his team in the late 1980s. Hyperlinking has also been used in standalone desktop products, such as the hypertext fictional webs published by Eastgate publications in the 1990s using their hypertext authoring platform Storyspace.[13] Whereas hypertext links nodes of text, hypermedia webs are linked nodes of text and/or media such as images and movies. These require more space and processing power on the computer and in the 1990s were much more difficult to publish on the Internet. The Chimera Web (see below) is an example of this kind of hypermedia web.

Lev Manovich took a rather different standpoint on hyperlinking when he formulated his concept of the database narrative (Manovich 2007). He pointed out that the opposition of database and narrative is a symbiotic one. Databases have a data structure that contrasts to the algorithmic structure of a narrative. Not all interfaces have an algorithmic structure to provide access to the database (see, for example, the thematic collections of *Remixing Çatalhöyük* below). But other interfaces—with a more obvious algorithmic narrative structure—can be drawn from the same database, as we are doing with the *Last House on the Hill* (perhaps) and *Dead Women Do Tell Tales* (see below). The potential of the database narrative concept is the creation of a complex, fluid—even ephemeral—web of alternating interfaces/narratives, as Manovich himself created in his SoftCinema.[14]

Internet

The World Wide Web started in 1993 with (what we now call) Web 1.0, in which pages were authored and served to users who could search, explore links, receive, and download the information. Among such sites, portals to organizations and archaeological projects have played an essential role in disseminating information. "Web 1.0" usually implies a gap between content provider and a "webmaster/mistress" who updates the site; the lack of instant updating has resulted in many of these valuable portals being out of date or even among the disappeared. This, for example, was the fate of the BACH project website.[15] The portal of the Çatalhöyük Research Project has been sustained, especially once (1998) its database was online (Wolle and Tringham 2000).

Web-served databases meant that searching and downloading data from a large database, such as the excavation database of the Çatalhöyük Research Project, could be done directly from a web browser interface more quickly and without restriction by operating system.[16] This development went hand-in-hand in the late 1990s with high-speed Internet access, servers with greater storage and ubiquity, and more powerful web-searching engines. This has revolutionized the way we do research, teaching, and authoring with digital technology. The profusion of content accessible to the world has led to challenges, however, with intellectual property (mentioned previously), means to establish security of sensitive data, as well as the need for standards of documentation of the data.[17]

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[13] http://www.eastgate.com/catalog/Fiction.html (accessed 06/30/12).

[14] The Soft Cinema website includes samples of videos: http://www.softcinema.net/index.htm?reload (accessed 06/30/12).

[15] The BACH website languishes at: http://diva.berkeley.edu/projects/bach/catal/default1.html (accessed 6/30/12).

[16] The database may be reached at: http://www.catalhoyuk.com/database/catal/ (accessed 06/30/12). Since 2005, all the data and media of the ÇRP has been made openly sharable with a Creative Commons 2.5 license.

Since 2000, the Internet is being transformed by the so-called "Web 2.0 interfaces" in which the content (media as well as textual commentary) can be uploaded without any middleperson. What this implies is that updating and communication is immediate. Archaeological projects are just beginning to take advantage of social networking applications, such as Çatalhöyük's Facebook group, Flickr image sets, YouTube movies (Tringham 2012b),[18] and diary-like blogging, for example, of the excavation process of the Prescot Street 2008 Dig.[19]

Digital Window on Household Archaeology

In the preceding section, I have discussed the transformation of our means of communication and the expression of popular culture and academic publication to embrace and be dominated by digital formats in a remarkably short time, spanning my postdoctoral professional career (Tringham 2010). Part of what we as archaeologists have been striving for is that the results of our archaeological investigations do not themselves become part of the archaeological record, languishing and rotting in a forgotten place. I believe that the digital formats have made (and hopefully will continue to make) a significant contribution to the long-term preservation of archaeological archives and their accessibility as sources for information and re-contextualization into new knowledge. These contributions are not inherent in digital technology but have to be enabled by the archaeologists who are providing the content and the digital architects who help them make it happen. The operas that I describe below represent different formats through which this contribution can happen. They are described chronologically so that you can see that we are approaching ever closer to this goal.

Of these digital technological revolutions, I believe the one that has the greatest significance for our creativity as archaeologists is the potential to express the complex interweaving of multiple lines of evidence, multiple scales of interpretation, the ambiguity of meaning for multiple voices with alternative scenarios, and—most importantly—to make these processes transparent and thus more engaging (Joyce and Tringham 2007; Kenderdine et al. 2008; Pink 2006; Wolle and Tringham 2000). The combination of feminist critique of science and digital technology has guided me to using my imagination to build interpretive narratives out of our archaeological databases in a way that has given me much greater creative satisfaction than writing any paper publication could. The results are a series of household archaeology opera

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[17] I recommend the best practice guidelines at ADS: http://ads.ahds.ac.uk/project/goodguides/g2gp.html (accessed 06/30/12).

[18] Colleen Morgan has a useful summary of Web 2.0 applications for archaeology on her Middle Savagery blog: http://middlesavagery.wordpress.com/2009/06/16/the-utility-of-various-social-networking-tools-for-archaeology/ (accessed 6/30/12).

[19] http://www.lparchaeology.com/prescot/ (accessed 6/30/12).

(singular opus, like a musical composition) based in my research in southeastern Europe and Anatolia.

The Chimera Project and the Chimera Web

The Chimera Project in 1993–94 was my first experience with 3D visualization/drawing software. Working with Michael Ashley, a senior at U.C. Berkeley at the time, we had talked about ways to visually link archaeological data to its interpretation and the potential of CGI for immersing a user in the environment of the past. As part of his senior thesis, Michael, along with Julian Liao—a graduate student in architecture—created a model of one of the burned houses at Opovo in which images were juxtaposed in a montage to visualize its transformation from occupied house to burned-out skeleton in its past landscape of reeds to archaeological place in its modern landscape of cornfields.

In the following year, using new multimedia authoring software—Macromedia Director—I started to expand on Michael's idea, creating an interactive hypermedia opus—the Chimera Web—with content from the Opovo project. Several of the steps exploring households with faces that I had been describing in paper publications in the early 1990s were given their digital expression in the Chimera Web. I have described this process and the exhilaration of transferring from paper to digital formats in a number of publications (Joyce and Tringham 2007). It was especially the open-endedness and democratization of the digital format that I found inspiring, in that it provided an opportunity to use data-centered imagination to present the multi-vocality of alternative viewpoints and interpretations that were more engaging to create and, I think, to "read" than the closed definitive story represented by the printed word.

The narratives of the burning of House 2 are told through the voices of two female survivors, Baba and Yaya. They did not really exist of course, but someone like them certainly did. They are a medium though which the archaeologists give voice to the past. These people are given fictional biographies and are placed on a multi-scalar chronological chart at an appropriate point of Opovo's stratigraphy, associated with the biography of a house and household (Tringham 1994: fig. 6). At different periods of their lives, they embrace other Neolithic settlements of the region. Their narratives are fiction, but they are grounded in the archaeological data. The Chimera Web was initially designed with a hypertext authoring program called Storyspace that I used as a mind-mapping platform. The design (fig. 7) ambitiously aimed to link the imagined narratives to a web of data about the Opovo archaeological project, the investigation of Neolithic house fires, modern arson investigations, the sociopolitics of archaeology in the Balkans, and the basis of the project in archaeological method and theory as well as the excavation database (for this point, see above, regarding "4thDimension"). Unfortunately, the link to the database proved elusive using the technology and expertise available to me at that time (1995–2002).

Unlike Rosemary Joyce's hypertext "Sister Stories," which was entirely authored in Storyspace (Lopiparo and Joyce 2003), I chose to build the Chimera Web in the multimedia authoring application Macromedia Director, in order to incorporate a rich audio-visual content. The program could create simple animations and animated transitions as you pressed buttons and moved around the Web. Much, but

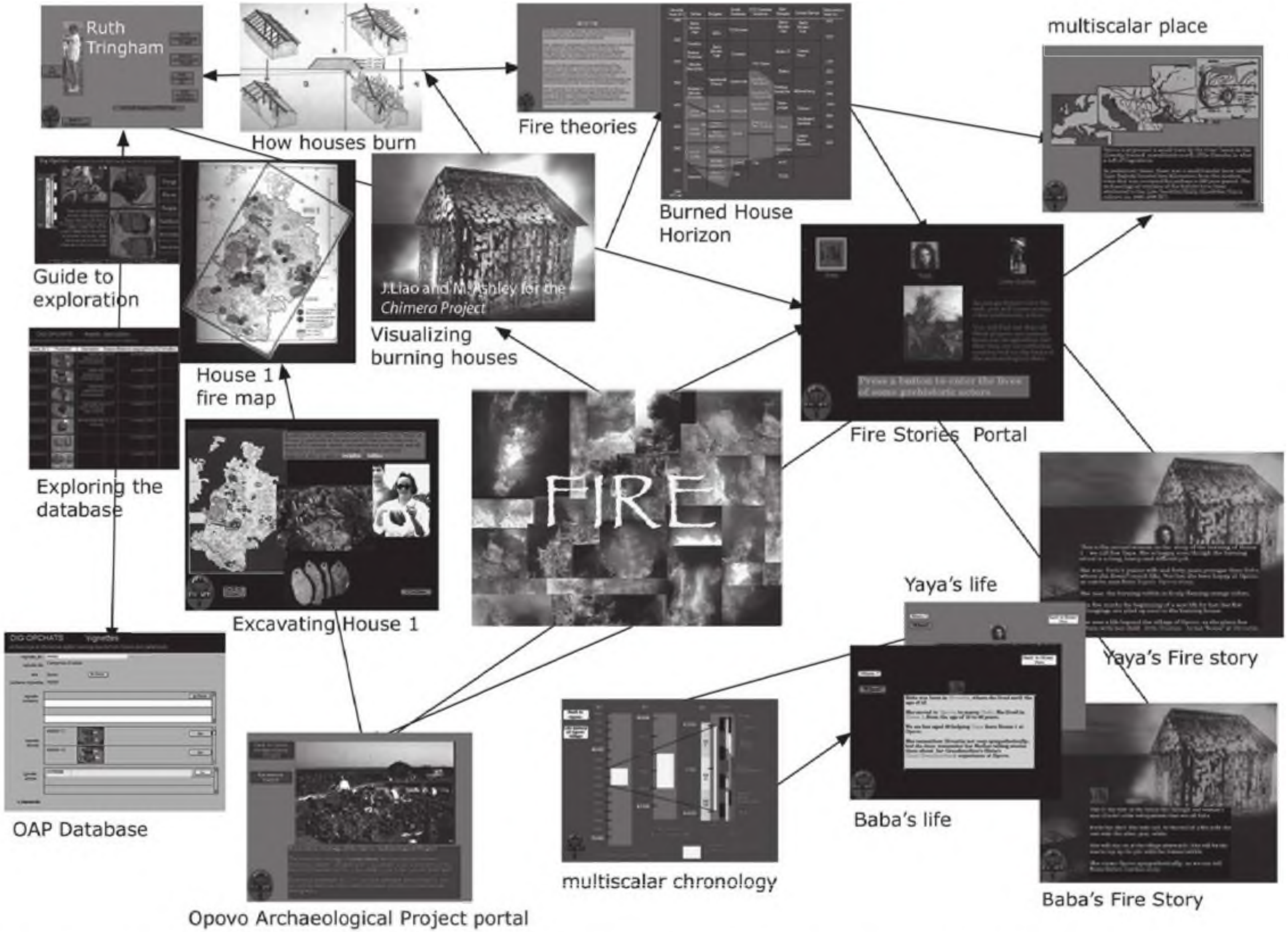

Fig. 7. A simplified version of the structure of the *Chimera Web* with some nodes and links extracted from the hypermedia web (after Joyce and Tringham 2007: fig.4).

not all, of the Storyspace content was transferred to the Director version. The opus was originally designed in 1995–96 to be published as a standalone DVD as a semi-commercial product. This choice was partly determined by the inability of the World Wide Web at that point (and several years after) to handle a complex web of interactive images and text. I was also nervous about putting my data and ideas on a public and "insecure" place (Joyce and Tringham 2007). In the end, products on a standalone DVD have almost passed into oblivion and the Internet has become the dominant medium of digital publication. Moreover, the Chimera Web will no longer function in Director. It is time for it to be migrated to a web-based platform, but its content will probably be absorbed into *Dead Women Do Tell Tales* (see below), where it will be transformed from a hypermedia web of narratives to a web of narratives that articulate with an on-line database.

Database Narratives of Çatalhöyük

As mentioned above, the Çatalhöyük Research Project has an online database of excavation data and a separate catalog of images. The BACH project has data within this online database; its data are also stored in an online Filemaker database in which both excavation data and media are integrated. Before the latter was constructed, the images and selected video were served in a separate (Extensis Portfolio) online catalog that formed the basis for two very different interfaces: "Remixing Çatalhöyük" in 2006–7 and "Okapi Island in Second Life," established in 2007. These interfaces both act as a means of sharing the archaeological research in a way that engages the public in actively exploring and making meaning out of the on-line media database of archaeological research—beyond just allowing access to search and see.

Remixing Çatalhöyük

Remixing Çatalhöyük[20] (fig. 8a) grew out of the earlier Dig OpChat project (see below, fig. 8c), with the added responsibility of being funded by a US Federal Education (FIPSE) grant. Public engagement with Çatalhöyük data is engendered through a series of guiding thematic interfaces created by a team of media specialists and archaeologists, including me. For each theme, 50 items (images or videos) were chosen from the BACH media database and provided with detailed captions and an accompanying introductory text. The public was encouraged to download the media and re-contextualize them into new media pieces and then upload them as a contribution to the interpretive process. They could also explore the complete media database further from this site. The themes include the Life Histories of People, Places and Things, the Senses of Place, and Archaeology at Different Scales, all of which express aspects of household archaeology investigated in the BACH project. As mentioned above, these thematic collections are not strictly database narratives in the sense described by Manovich, since they do not really have a narrative algorithmic structure. Yet, in our selection of the images and caption writing, they do approach the format of the database narrative.

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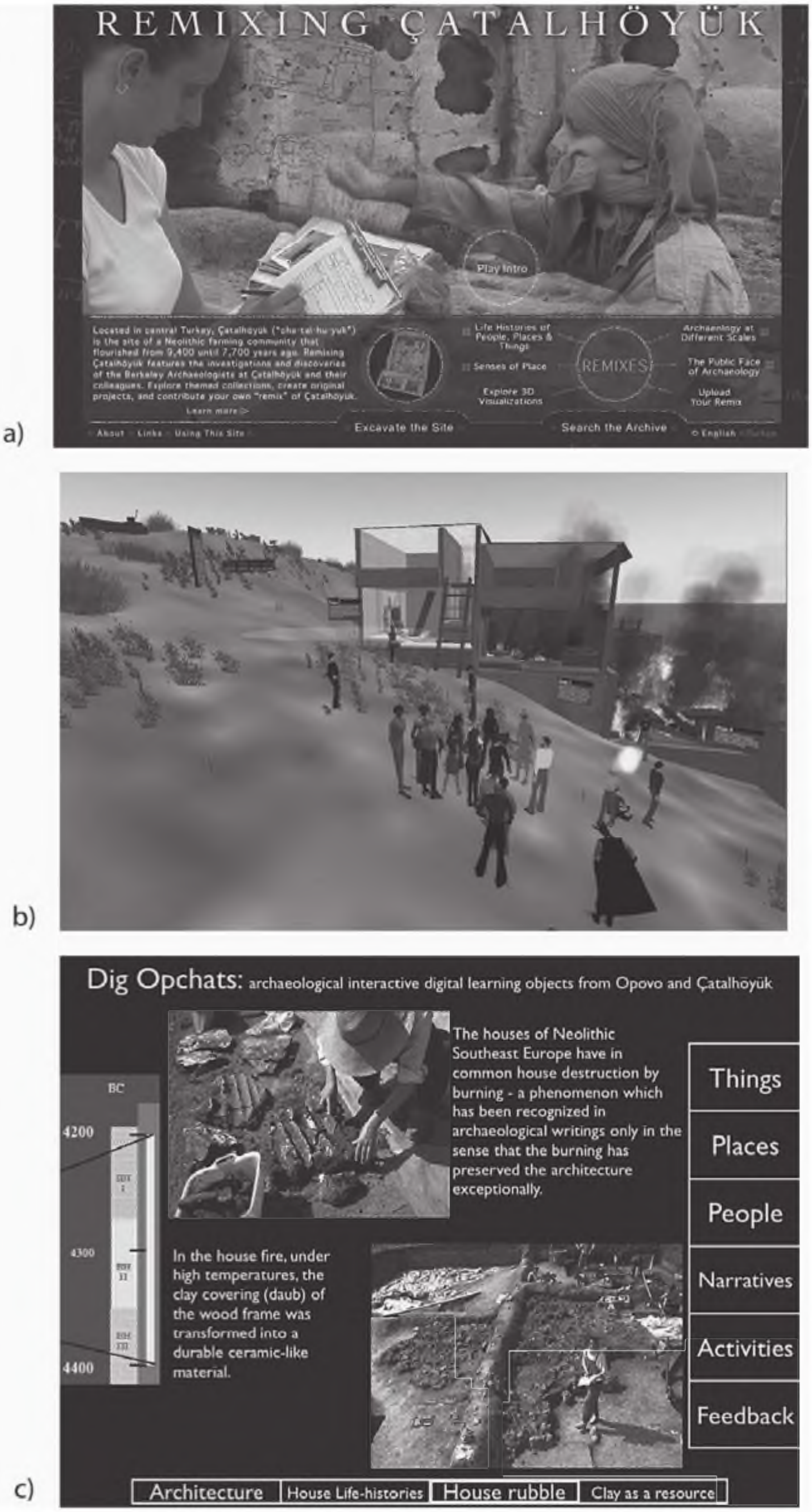
[20] The project blog is at http://okapi.wordpress.com/projects/remixing-catalhoyuk/ (accessed 6/30/12). Remixing Çatalhöyük in English or Turkish may be visited at http://okapi.dreamhosters.com/remixing/mainpage.html (accessed 6/30/12).



Located in central Turkey, Çatalhöyük ("cha-tal-hu-yuk") is the site of a Neolithic farming community that flourished from 9,400 until 7,700 years ago. Remixing Çatalhöyük features the investigations and discoveries of the Berkeley Archaeologists at Çatalhöyük and their colleagues. Explore themed collections, create original projects, and contribute your own "remix" of Çatalhöyük.

The houses of Neolithic Southeast Europe have in common house destruction by burning - a phenomenon which has been recognized in archaeological writings only in the sense that the burning has preserved the architecture exceptionally.

In the house fire, under high temperatures, the clay covering (daub) of the wood frame was transformed into a durable ceramic-like material.

Fig. 8. Early approaches to database narratives using the BACH data: (a) *Remixing Catalhöyük* (screenshot); (b) *Okapi Island in Second Life* (screenshot); (c) *Dig OpChats* (after Tringham 2004: fig.18).

Okapi Island

Okapi Island,[21] like Remixing Çatalhöyük, is sponsored by the Open Knowledge and the Public Interest (OKAPI) initiative at U.C. Berkeley.[22] It is an island in the online virtual world of Second Life (see above) and allows virtual residents (avatars of real-time players) to explore 3D reconstructions of Çatalhöyük (fig. 8b). The island engages the public in the multisensory experience as avatars of moving across the mound as a modern location of archaeology or as a prehistoric place. Residents may be given permission to build their own houses or furniture and facilities, using textures from the BACH media database. We have experimented with seasonal changes, house fires, and even role-playing group action. It has been a location for teaching about daily life at the site now and in prehistory and for meetings and discussions, even movie festivals.

Last House on the Hill

"Last House on the Hill" is the online digital mirror of the printed monograph report of the BACH project *Last House on the Hill* (see p. 92, n. 1). In this opus, the database of the excavated materials and media provides the basis from which to draw the narratives about the household(s) that lived in the BACH Area, the people who passed to and fro, and the archaeologists who also passed their seven years here. This opus, which by definition is always a work in progress, will be launched to public view in September, 2012. It fulfills an ambition that Michael Ashley and I have long held, that is, to embed, interweave, and otherwise entangle the data and media from the archaeological excavations with their interpretation and meaningful presentation in an open-access, sharable platform. This kind of integration has become possible only in the last few years with the availability of complex web publishing, searching, and archiving features that can assure the long-term durability and integrity of both data and its meaning (Ashley et al. 2012; Tringham and Ashley 2012b).[23]

The archaeological project itself is considered the central node, the original event that brought together people, places, things, and media and gave origin to the complex network of information about the project (fig. 9). The requirements for an online, collections-based web-publishing platform are formidable due to the complexity and sheer mass of data and media we wish to reconcile. The primary database contains millions of records. The media alone consists of more than 15,000 images, hundreds of video clips, plus CAD drawings, illustrations, sketches, and plans. This critical mass of archaeological documentation gains its full significance for a practice-based study of household archaeology if represented as the relationships between people, actions, tasks, time, and space contingencies—all of which contribute to the creation of the archaeological record. Narratives may be drawn out of the database through the filter of the alternating perspectives or standpoints of people,

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[21] Okapi Island could formerly be visited at http://slurl.com/secondlife/Okapi/128/128/0 (accessed 2/23/09). Other information about Okapi Island is still found at http://okapi.wordpress.com/projects/okapiisland-in-second-life/ (accessed 9/5/11) and http://www.ruthtringham.com/Ruth_Tringham/Okapi_Island.html (accessed 2/2/12). Unfortunately, due to the doubling of land rent on SecondLife, Okapi Island itself has become archaeological as of February, 2012.

[22] http://okapi.wordpress.com/ (accessed 6/30/12).

[23] The progress of the Last House on the Hill is documented in its blog at: http://www.codifi.info/projects/last-house-on-the-hill/ (accessed 6/30/12).

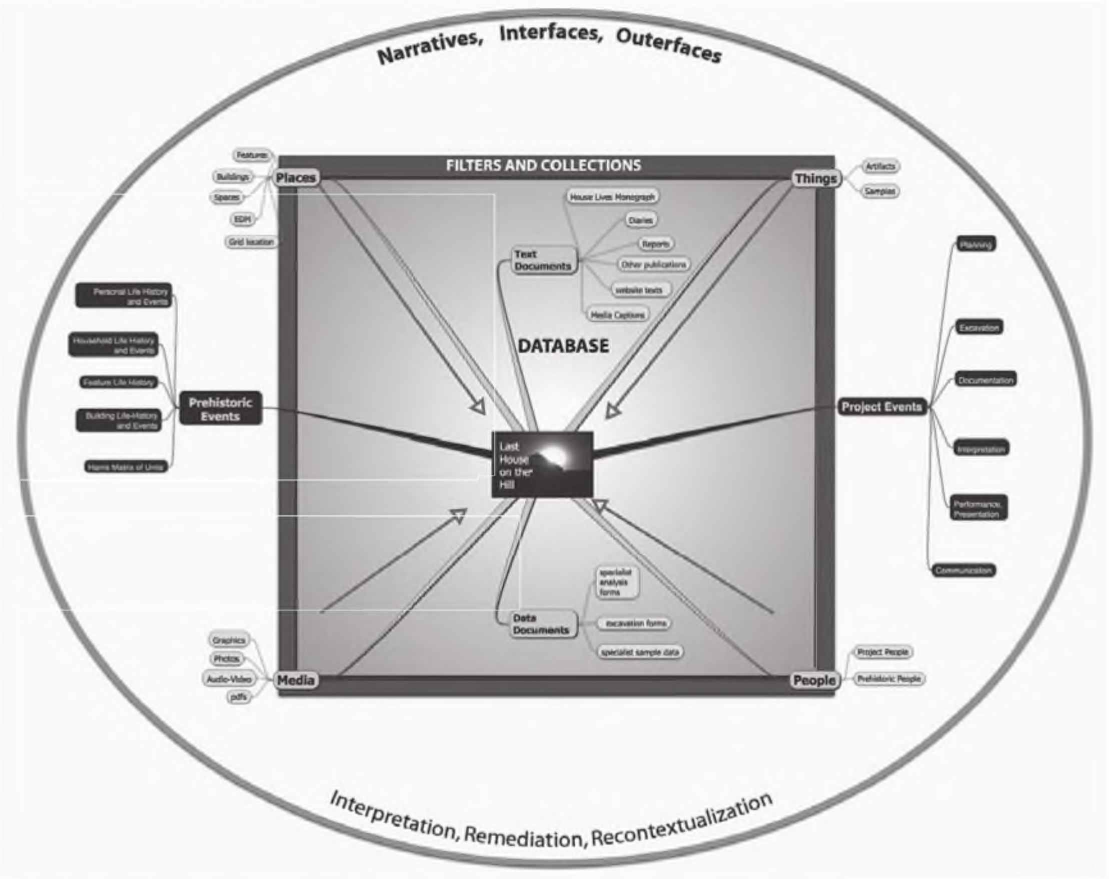
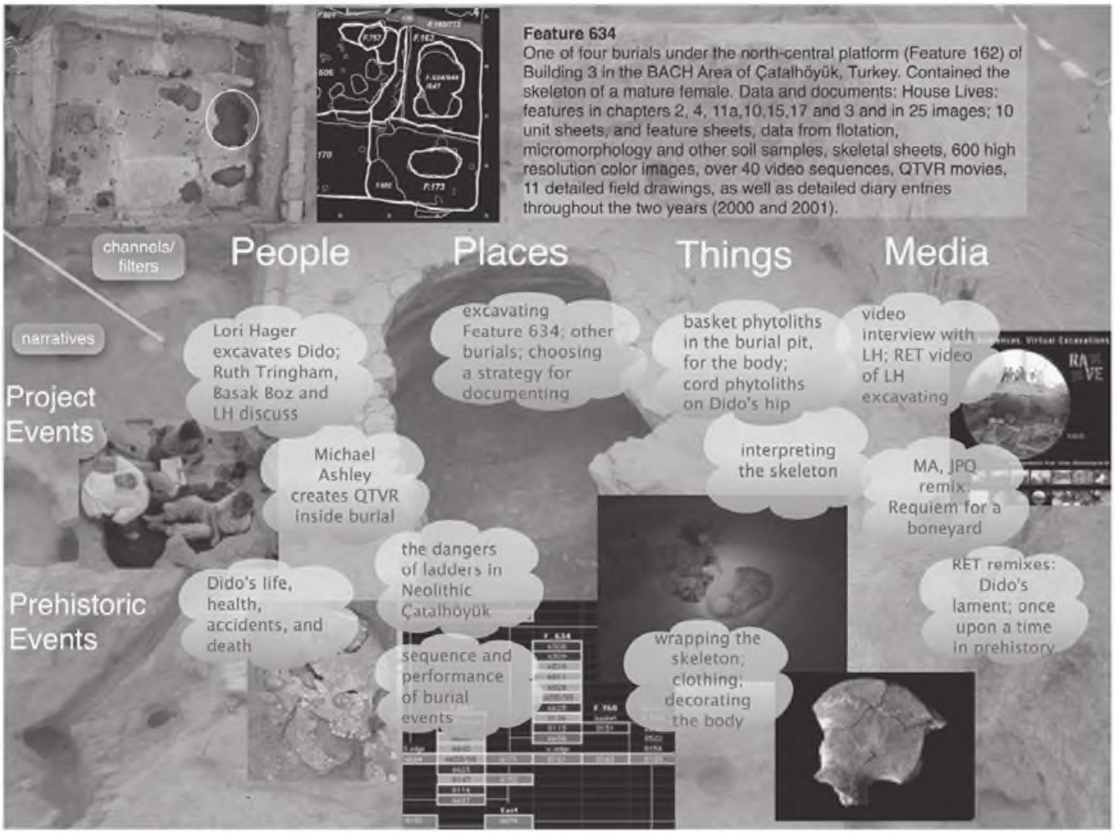


Fig. 9. The structure design of the *Last House on the Hill.*

places, things, and media, which enable the re-contextualizing and remixing of the content in the database.

Dead Women Do Tell Tales

To put the narratives that are drawn from the data into an interface (or more elegantly, "outerface") framework that is appropriate to the multiscalar study of social practice in Neolithic households and neighborhoods for which the BACH project itself was designed, groups of events have been identified at the core of the structure of the opus: the events in archaeological (Neolithic) time and the subsequent formation of the archaeological record, and the recent events linked to the BACH excavation project. Out of this structure, an endless configuration of people, places, and things can be created as vignettes or narratives, seen as juxtapositions of image and text or video montage or text alone. In fig. 10, the static two-dimensional representation of such a configuration is attempted—with very unsatisfactory results—for a set of data for the burial Feature 634.



Feature 634
One of four burials under the north-central platform (Feature 162) of Building 3 in the BACH Area of Çatalhöyük, Turkey. Contained the skeleton of a mature female. Data and documents: House Lives: features in chapters 2, 4, 11a,10,15,17 and 3 and in 25 images; 10 unit sheets, and feature sheets, data from flotation, micromorphology and other soil samples, skeletal sheets, 600 high resolution color images, over 40 video sequences, QTVR movies, 11 detailed field drawings, as well as detailed diary entries throughout the two years (2000 and 2001).

channels/ filters
People
Places
Things
Media
narratives
Project Events
Prehistoric Events
Lori Hager excavates Dido; Ruth Tringham, Basak Boz and LH discuss
excavating Feature 634; other burials; choosing a strategy for documenting
basket phytoliths in the burial pit, for the body; cord phytoliths on Dido's hip
video interview with LH; RET video of LH excavating
Michael Ashley creates QTVR inside burial
interpreting the skeleton
MA, JPQ remix: Requiem for a boneyard
Dido's life, health, accidents, and death
the dangers of ladders in Neolithic Çatalhöyük
RET remixes: Dido's lament; once upon a time in prehistory
sequence and performance of burial events
wrapping the skeleton; clothing; decorating the body
F 634
F 768
East

Fig. 10. Some of the countless narratives that can be channeled from the database of Feature 634 in Building 3 through the filters of people, places, things and media in the *Last House on the Hill.*

"Dead Women Do Tell Tales" (still under construction[24]) takes this exploration of transparently entangling archaeological data and interpretation one step closer to what Manovich has described as Database Narratives. Many of the fragments and narratives of the Last House on the Hill feed into this opus. I have been thinking about this project for many years as part of the rationale for working in Turkey after a career, which up to 1997, had been focused in the prehistory of southeastern and central Europe. "Dead Women Do Tell Tales" compares the Neolithic trajectories of southeastern Europe and Anatolia, focusing on the contrasting attitudes to the continuity of place and the role of the household in a complex social context (Tringham 2000). In fact, in 2002 I had started this project under a different name as a much simpler hypermedia web called Dig Opchats (fig. 8c) that comprises vignettes constructed out of the databases of the Opovo and Çatalhöyük projects (Tringham 2004). Both these operas chew at the question of why, if households are the unit of social reproduction in the Neolithic of both southeastern Europe and the Near East, is there such a contrast in the trajectory of the two regions toward the establishment of centralized authority and urbanism in which the power of the individual household is lost? In focusing on this question, the project explores the contrast between the everyday life and life-histories of people, places, and things on a settlement mound ("tell") and those on an "open" site (see also Tringham 2000).

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[24] The progress of *Dead Women Do Tell Tales* is shared on its blog at: http://www.ruthtringham.com/Ruth_Tringham/Dead_Women_Do_Tell_Tales.html (accessed 6/30/12).

"Dead Women Do Tell Tales" is a "recombinant history" made up of fragments from the prehistory of households in Southeast Europe and Anatolia. The idea of "Dead Women Do Tell Tales," a hypermedia product with endless options and configurations of media with which to build narratives of place and history, is based very closely on the idea of database narratives discussed above (Anderson 2011; Manovich 2007). Steve Anderson recognizes two directions in which historiography has taken advantage of digital technology. On the one hand is the idea of amassing the "total" historical record of events, facts, and media through accessible networked interoperable databases. On the other hand, "digital technologies have enabled strategies of randomization and recombination in historical construction resulting in a profusion of increasingly volatile counter-narratives . . . and histories with multiple or uncertain endings" (Anderson 2011: 125). Database narratives (or "recombinant histories" as Anderson calls them) take advantage of both of these aspects of digital technology. It is this idea of the fragmentary nature of memory and history drawn from a database with structured relations that I apply to the sharing of past and present places in this and the two preceding projects.

The fragments may be created out of text, film, images, or animations contained in the databases. They may be narrative fragments about the process of archaeological interpretation (from burned rubble to a mouse running out of the house fire), or the interpretation itself (what do you see 6,000 years ago when you burn a house, alternative visualizations). As in the "Last House on the Hill," images may be combined to make a montage and then re-combined to make a very different narrative, perhaps by the focus on a different actor, or task, or place, or time. Videos of an excavation scene are re-contextualized in a fictional prehistoric place to remind us that our interpretations are based on fragmentary data and the intentions of the individual archaeologist. We can draw out of our database limitless such fragments—narratives that are sparked by observing patterns in the spatial or chronological occurrence of artifacts in the excavation record, others by juxtaposing conversations on a video with narratives from a text, or by images with diary entries. In this sense, history is multi-formatted, cumulative, never complete, and hard to grasp as a definitive story.

The "Dead Women Do Tell Tales" project is designed to comprise four forms of publication that together create the recombinant prehistory. First are the accessible and interoperable databases of the BACH and Opovo projects. Second are short narratives/vignettes (text fragments, video clips, image sequences) that are created by re-purposing media from the primary database. Each vignette links through the databases to other fragments (similarly to Amazon.com's "readers who read this book also read these . . ."). Third is the major database narrative—"Dead Women Do Tell Tales" itself—in which I recombine all of the above into a history of people in different places at different times. The focus will be on women archaeologists, visitors, and residents (of all ages) in the prehistoric places, on their multisensory experience of the places, on their ability to create memories through reference to their bodies and their world, and on the life-histories of themselves, their houses, their villages, their things. The narrative is non-linear but the lives of a single household in each place can be followed in a plot that continues as a fragmented linear narrative, a kind of mystery, drawing the reader of the narratives into the recombinant nature of this history with no defined ending.

The final publication form is an invitation to other users to create their own recombinations of fragments, just as users of a database are invited to save their search tables while exploring a regular on-line database. Out of these data are limitless strands that can be followed to explore people, places, things, and events that are entangled in specific spatial contexts in the modern as well as the prehistoric time-frame. Walls, baskets, burials, the procedures in their retrieval, the people who excavate them—all can be used creatively to produce new narratives or readings that I would not have had time or imagination to think of. The structure of the opus guarantees that any interpretive narrative will be firmly anchored in the empirical data of the projects, and at every step the author is required to argue and embed the rationale for his/her interpretation in terms of plausibility.

Conclusion: Households through a Digital Lens

When I was writing chapter 22 of *Last House on the Hill*, which focuses on the Senses of Place at Çatalhöyük (Tringham 2012a), I could do little more than suggest, as tantalizing but disembodied fragments, such narratives as those proposed for *Last House on the Hill* and especially for *Dead Women Do Tell Tales*, narratives that almost certainly go beyond the strict empirical boundaries of the excavated data. To have demonstrated the path by which I arrived at such fragments and its entanglement with the data at its source would have taken a very long time as a linear text. And yet, as I have repeated at numerous points throughout this essay, this is the detail and complexity that will allow us to investigate the nature of everyday life and households in the past. The exciting potential of digital technology is that it allows us to elegantly express that complexity in a way that, because of the seduction of audiovisual expression, is nevertheless engaging to people who did not participate in these projects. The alternative is to simplify the process, and to do so would ultimately be creatively less satisfying.

My final point is another that has occurred more than once in this chapter and concerns the sustainability of our archaeological product, especially when born digital. For long-term preservation, two conditions need to be met. The first is that the data—the documents of our research—are "born archival" or at least embedded with information in a non-proprietary format (Ashley 2008; Richards 2004). The second condition is that the archive be usable, meaningful, and used. The databases of the Opovo and Çatalhöyük Research Projects are openly sharable through Creative Commons licensing, so that we have the flexibility to create multiple narrative interfaces such as those described previously. However, the interfaces are ultimately ephemeral—even those we are proud to call "engaging." Moreover, just as I have described in the time-frame covered by this chapter, their meaning and engagement and the current meaning of household archaeology itself may not last. However, other interfaces and narratives will emerge. It is important to recognize this, and keeping up with the users of the opera is possible more easily in a digital than paper format. The whole effort is sustained on a strong foundation of a rich database of well archived content that has been designed to last a very long time, even millennia!

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Section 2

Methodological Advancements in Household Studies

Particles of the Past:
Microarchaeological Spatial Analysis of Ancient House Floors

Isaac I. T. Ullah

Introduction

A major objective of household archaeology is to understand better the processes through which ancient people created and modified the built environment and how these processes change through time and space as functions of style, necessity, material, climate, social interaction, and economy. A second objective of household archaeology is to understand the way people used their dwellings, how they arranged activities within them, and how the features of the dwellings shaped these patterns. Although most archaeologists who excavate houses try to deal with both of these objectives, processes of site abandonment and site formation tend to obscure the second more than the first. Unless one is fortunate enough to dig at a "Pompeii" (Binford 1981; Schiffer 1985), the larger artifacts left on the surfaces of house floors are not likely to be where they were used during the life-cycle of the house. Even given a Pompeii-like situation, the position of the large artifacts may not reflect the way a space was most commonly used in everyday life. To see long-term patterns in the use of space, one must examine the small things that get left behind when all the larger items are removed. Spatial analysis of the microartifacts recovered from house floor sediments may better resolve these long-term patterns than analyses of the larger-sized artifacts found on the same house floor.

What are microartifacts and why are they important? As an informal rule, I define microartifacts as any human-produced debris whose maximum length is smaller than about half a centimeter, although this should vary depending on context.[1] Perturbation of their spatial patterning by natural site formation processes may be less than that of larger artifacts found in the same deposits (Fladmark 1982; Rosen 1986). In other words, smaller-sized artifacts may remain closer to where they were originally deposited. They may also be less susceptible to cultural formation processes, in that they are less likely to be moved around by certain types of cleaning activities and are very unlikely to be removed upon site abandonment (Hull 1987; LaMotta and Schiffer 1999; Rosen 1993; Sherwood et al. 1995). Significant quantities of microartifacts are also likely to accumulate where certain activities or suites of activities were routinely performed (Hodder and Cessford 2004).[2]

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[1] See Healan 1995 for common microartifact size ranges.

In most previous microartifact studies, a few large sediment samples are taken from within a room (e.g., Metcalfe and Heath 1990; Simms and Heath 1990). These samples are separated by flotation, size-sorted through screens, and then all the microartifacts are removed from the sediment. The data thus generated are used as the bases of interpretations of what the room was used for. However, this sampling strategy poorly represents the spread of microartifact densities across the room floor. The profile of microartifact densities in a given sample depends greatly on where the sample was taken. For example, hearth debris and the debris found near door thresholds are going to be very different from one another, and each will be very different from debris taken at other spots on the room floor. Taking samples only from areas that are near identifiable architectural features precludes a total understanding of the use of space within a room as a whole. To do so, one must employ better spatial coverage when sampling for microartifacts by taking many smaller samples from different areas.

In this essay, I examine the spread of microartifacts from house floors during two consecutive occupational phases at the Late Neolithic site of Tabaqat al-Buma in northern Jordan (fig. 1).[3] Samples were collected from spatially contiguous grid-cells across the entirety of the intact portions of the floors. These data were then examined via a series of spatial techniques using the computing power of a modern GIS software platform (GRASS GIS [GRASS 2009]) and combined with information derived from spatial analyses of larger artifact types and architecture to gain a more holistic understanding of how the use of interior space changed at the site over time.

Case Study

Tabaqat al-Buma was excavated from 1987 to 1992 by the University of Toronto's Wadi Ziqlab Project. Late Neolithic sites in northern Jordan are rather dispersed, and those in Wadi Ziqlab are better described as small farmsteads rather than villages (Banning 2001). The period is characterized by coarse pottery with some incised, painted, and burnished decorations (Gibbs et al. 2006). Cores are non-standardized and the bulk of the lithic assemblage is composed of unretouched flakes (Kadowaki 2005). The most common lithic tool types are non-formal flake tools, chipped and ground adzes, cortical scrapers, and highly retouched denticulated sickle elements, and there are several types of basalt grinding implements. Basalt does not naturally occur in the vicinity of the site, so basalt microdebris recovered at the site most likely derives from these imported basalt implements.

The site of Tabaqat al-Buma is located on a small alluvial terrace near the active channel of the Wadi Ziqlab drainage at a point in the watershed dominated by limestone bedrock. The Late Neolithic occupation at Tabaqat al-Buma occurred in five distinct architectural phases from ca. 5700 to 4200 cal B.C.E. (Table 1; Banning 2007; Banning et al. 1994; Kadowaki 2007). The site was apparently not abandoned between each phase, with the possible exception of a brief abandonment between phases LN4 and LN5, and was probably never home to more than three households

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[2] For a more complete review of these issues and more, see Rainville 2005: 17–36.

[3] Dated 5706–5542 to 5276–5072 cal B.C.E. (Banning 2007).

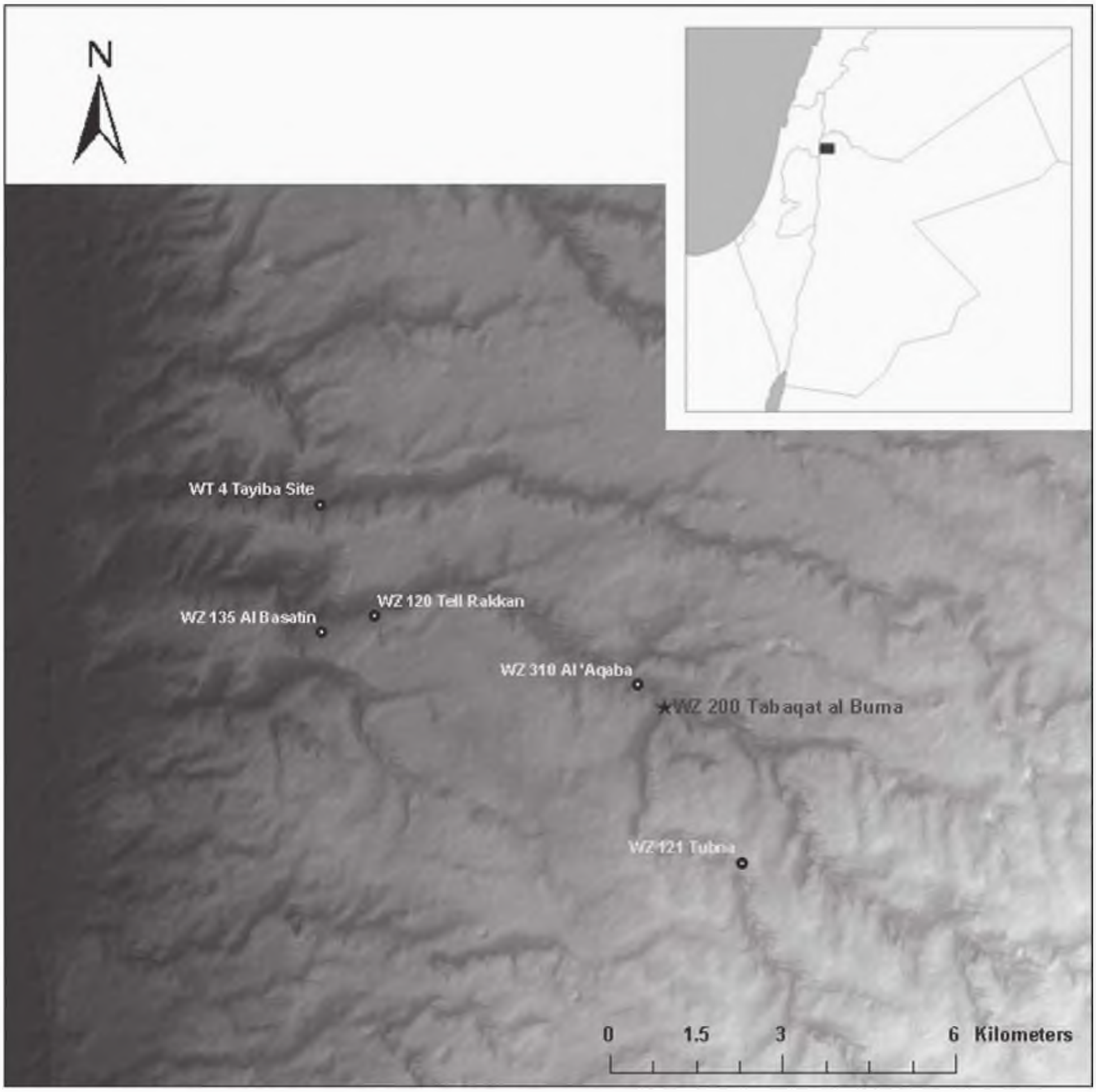

Fig. 1. The location of Wadi Ziqlab in northern Jordan (inset) and the location of Tabaqat al-Buma in Wadi Ziqlab in relation to other Neolithic sites.

at a time (Banning 2001). Economic data recovered from the site indicate a reliance on small-scale horticulture and pastoralism.

The first room-floor examined in this chapter belongs to structure G34 (fig. 2), which was built and first occupied during the Late Neolithic architectural phase LN3. During this phase, the building was most likely roofed and had an earthen floor. The main feature of the living space was a large plaster-lined hearth. The G34 building seems to have been the main domestic structure during this phase (Kadowaki 2007). A basalt hand-stone was also recovered from the G34 house floor context, indicating that basalt ground-stone implements were used in the room.

The second room-floor analyzed in this chapter belongs to the E33 structure, which was built at the beginning of the subsequent phase LN4. Although the G34

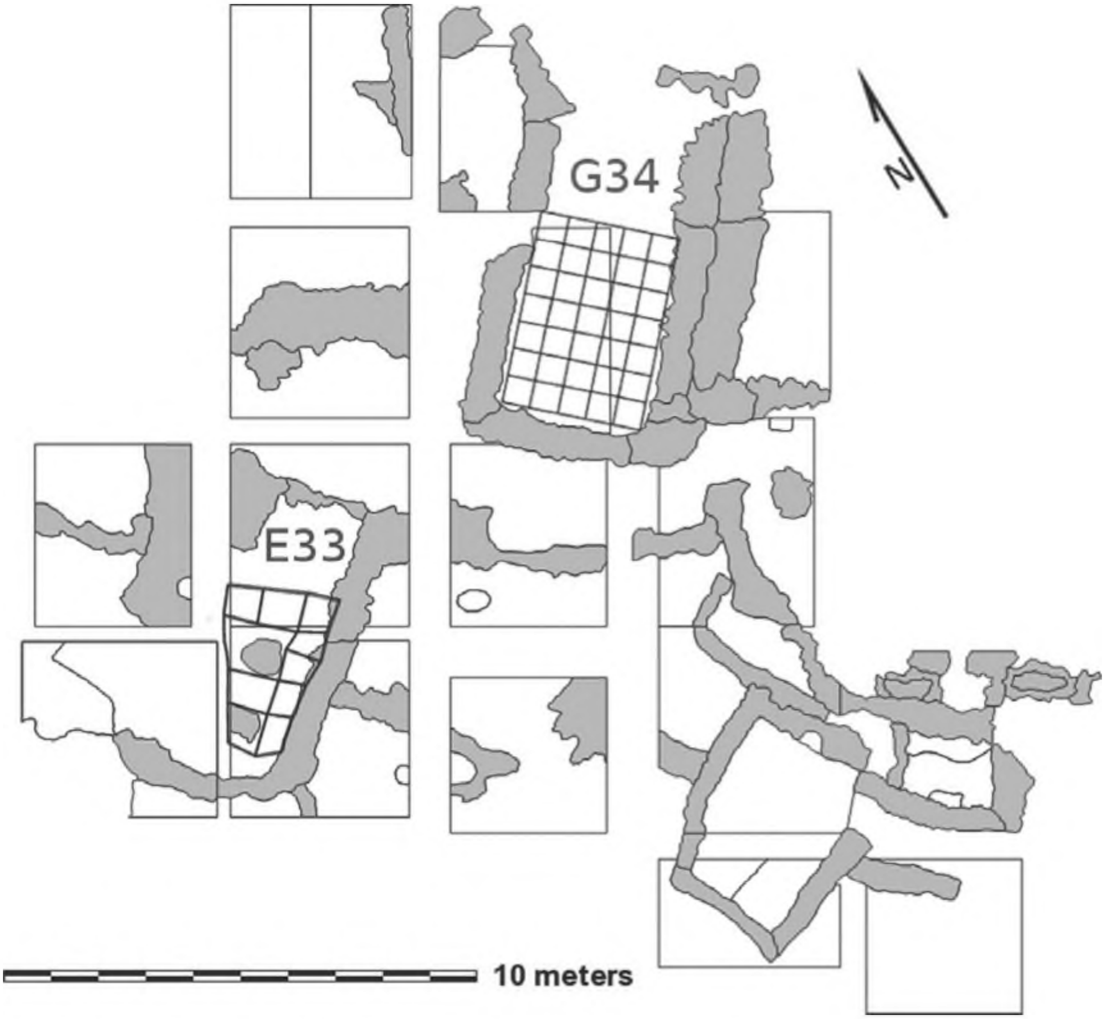

Fig. 2. Site Plan of Tabaqat al-Buma, showing microrefuse collection grids in the G34 and E33 buildings.

structure was still in use during this phase, it was likely now roofless and seems to have been used quite differently than in the previous phase.The E33 building seems to be the main indoor domestic space during this phase (Kadowaki 2007). It is worth noting that, unlike the G34 structure, the main indoor feature of this room is a large limestone mortar, and the floor was constructed from cobbles.[4]

Microartifact Types

The densities of several types of microartifacts and microecofacts were recorded in this study. Microartifact types include flint microdebitage, basalt microdebris, bone microdebris, shell microdebris, and pottery microdebris. Small fish vertebrae

[4] The E33 building was also reoccupied in the next and final Late Neolithic phase LN5, which began between 5276–5072 cal B.C.E. Micro-refuse data from the upper floor is being processed, but is currently unavailable for inclusion here.

were also identified from the E33 building, but these appear to be fossils that likely originate from the local limestone. Microecofact types include carbonized and uncarbonized botanical remains, charcoal, fossil shell, rodent coprolites, and insect carapaces. The spatial patterning of particular microartifact types should reflect ancient human activities (Rainville 2005). For example, one would expect that lithic microdebitage should be found in high concentrations near areas of flint tool production, use, or maintenance, while small pieces of bone and shell would occur near food-production areas or ornament- and tool-production areas.[5]

The spatial patterning of intrusive ecofacts, on the other hand, should indicate areas of potential postdepositional disturbance. Examining the constituency of the identified clusters offers a better understanding of the nature of the disturbance. Insect parts, rodent coprolites, rodent teeth, and intrusive, unburned botanicals indicate bioturbasive activity. Fossil shell occurs naturally in the soil, so its presence is not particularly alarming, but its absence might be. Likewise, charcoal in high quantities near identified hearths is not surprising, but high amounts of charcoal in other areas could be.

Methods

In an ideal world, room floors at archaeological sites would be preserved intact and microrefuse samples could be taken at high spatial resolution from all parts of the floors. However, archaeological reality rarely, if ever, meets these conditions, and therefore microrefuse samples should only be taken from relatively intact portions of room floors. The room floors of Tabaqat al-Buma are no exception to this rule, and for precisely this reason, the collection grids used on the two room floors examined in this chapter do not cover the entire interior space of the rooms. Instead, they were placed only over the portions of the floors that had not been disturbed by recent farming and road-building.

To facilitate later spatial analyses of microrefuse data, many researchers collect microrefuse samples from spatially contiguous collection grids, and grids of this kind were used to collect the microrefuse samples analyzed in this essay.[6] There are many potential problems with grid-based methods, including issues of scale, cell shape, grid orientation, and edge effects (Hodder and Orton 1976; Johnson 1984). The size and placement of the sampling grid largely depends on the size and quality of the floor deposits as well as on the position of baulks and trenches in relation to the architecture of the particular structure. The G34 structure was relatively large and well aligned with the excavation grid and so was sampled by a regular grid of half-meter cells. The E33 structure was smaller, was encumbered by a large immovable feature, and was aligned so that it was cut obliquely by the excavation trenches, and thus a less regular collection grid was used. In the future, collecting microrefuse as small point samples from the nodes of a lattice may partially circumvent such issues.

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[5] 5. Certain artifact types, such as poorly fired Late Neolithic pottery, can decompose over time, however, so it is important to correlate the patterning of the larger size classes of these artifacts with the patterning of the smaller size classes (Sherwood et al. 1995). This is the subject of another paper (Ullah and Banning 2007), so while I do not explicitly mention them in this chapter, correlations of this kind were considered in the analyses presented here.

[6] 6. For other examples of this technique, see Fladmark 1982, Hull 1987, Metcalfe and Heath 1990, Rainville 2005, or Sherwood and Ousley 1995.

For this project, all sediments from approximately 2 cm above the surface and from between cobbles in the G34 and E33 floors were collected from each grid square. The light fraction of each sample was removed by flotation, and then the heavy fraction size-sorted through a series of nested screens. The choice of a size class to analyze is influenced by several factors, including the severity of suspected formation processes and the quality of specific microartifact types. Some trial and error is needed here, and one should try to balance ease of analysis with quality of data. In the study presented here, initial experimentation showed that the 1.4–2 mm size class best meets these criteria for the samples collected from Tabaqat al-Buma.

As a way to minimize errors due to analyst fatigue, as well as to protect internal validity, a team of student volunteers was recruited to count artifacts from several three-cubic-centimeter subsamples from each grid square. Subsamples were continuously taken until the Standard Error for the cluster sample population was under 10%, and there was no significant difference between three samples at the 90% confidence interval. The analysis history of each analyst was recorded, along with the data, which allowed us to assess potential outliers in the sample population and remove them if they were obviously due to analyst bias. Once these criteria are met, the mean of the cluster samples from each grid square should accurately reflect the average density of microartifacts in that square.

Although there exist several methods to investigate raw microartifact grid square densities such as Local Density Analysis (Johnson 1984) and Grid-Based Unconstrained Clustering (Kintigh 1990), these methods produce statistics that must then be cross-correlated with the spatial pattern of the input data, so a more visual approach may be a better heuristic device. Fortunately, GIS software allows the interpolation of visually pleasing density plots that can also serve as inputs for mathematically complex statistical analyses (Mitasova and Mitas 1993). To do this with grid-based data, the densities of each grid square are assigned to a point in the center of that grid square. Because the interpolation algorithm statistically "fills the gaps" between each input point, it produces output maps that predict the spatial pattern of microartifact densities at a scale finer than that of the original collection grid (fig. 3a). It must be reiterated, however, that these interpolated density maps are only as good as the input data, and as such they are still subject to the all the same potential problems associated with grid-based data. For this reason, lattice-node point sampling may prove to be a more compatible data collection procedure for use with this type of analysis.

If the data are reasonably normally distributed, the resultant density surface maps can be transformed into Z-score units (fig. 3b). Areas that are more than one standard deviation above the mean are more likely to be real locations of de facto microrefuse or areas where microartifacts were concentrated by specific types of formation processes, such as sweeping, tracking in, or in situ decomposition of larger artifacts. Conversely, areas with densities sparser than one standard deviation below the mean are more likely to be areas where microartifact deposition did not occur or where certain site formation processes, such as the excavation of intrusive pits, have subsequently removed them. On the other hand, where microartifact densities are within one positive or negative standard deviation, the deposits are more likely due to site-formation "averaging" than to de facto discard.

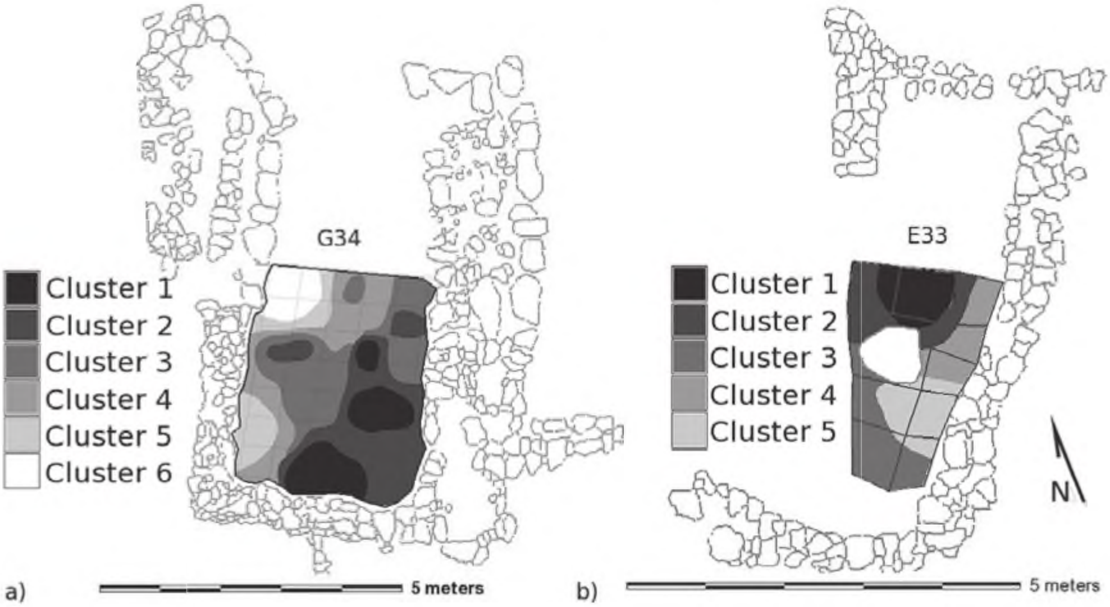

Fig. 3. Maps of unsupervised classification cluster definitions for microartifact types from (a) the G34 floor and (b) the E33 floor.

Although Z-score transformation of density maps makes it easier to investigate the distributions of individual microartifact types, it is difficult to compare the distributions of more than two artifact types at a time. If one wants to understand the interrelationship of the distributions of larger combinations of microartifact types, one must use a more robust quantitative method.

To accomplish this, I borrow a method known as "unsupervised classification," which is a type of cluster analysis very similar to K-means analysis and that is commonly used to classify multiband satellite imagery (Lillesand et al. 2004). To use this method with artifact distribution maps, one must first "stack" the maps to make a multiband image. Then image-analysis software compares the multiband "spectral signature" at each pixel of the map stack and then assigns all pixels to a predetermined number of clusters based on a user-defined measure of similarity (in this study, the Maximum Likelihood statistic). The artifact composition of each resulting cluster indicates the relative importance of specific artifact classes in the areas defined by that cluster's boundaries. The process is not a "black box"; there are several variables that need to be adjusted, and therefore it takes some trial and error to produce a meaningful result.

In order to understand the nature of the resulting clusters, one must examine the frequency of each of the microartifact types within each cluster and as compared to the other clusters. This assessment should examine the degree to which the density of each artifact type works to define the cluster and should compare the relative densities of each artifact type between clusters as well as the amount of influence specific artifacts have on defining the clusters. A useful way to do this is to obtain the average density of each microartifact type within the spatial boundaries of each

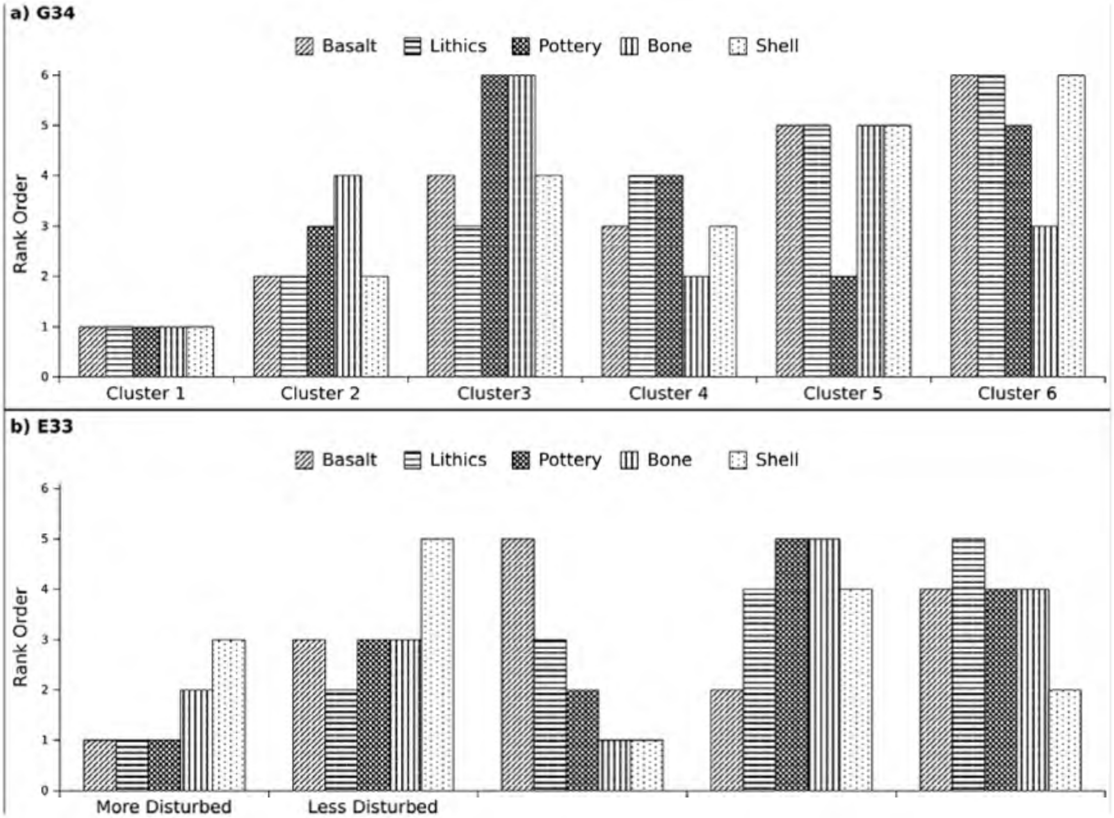

Fig. 4. Microartifact rank-order charts for cluster classifications for (a) the G34 floor and (b) the E33 floor.

cluster and then compare these densities using a simple rank order plot. In this way, we can not only see which microartifact types are more frequent within a cluster, but we can also compare the relative importance of a particular microartifact type across all clusters (fig. 4).

Results

Unsupervised classification analyses of various combinations of microartifact types from the Phase LN3 floor from G34 resolved six distinct clusters. Fig. 3a shows their spatial distribution and fig. 4a shows the relative frequency of each artifact type within the cluster. Some of the major patterns are the dominance of lithic microdebris in clusters 5 and 6, the relative importance of micropottery in cluster 1, and the relative importance of small pieces of basalt in clusters 2 and 3. There are slightly more bone fragments in cluster 2 and more shell fragments in cluster 3. Cluster 4 has a relatively mixed profile, although microlithics seem to dominate.

The results of unsupervised classification from the sampled portion of the Phase LN4 floor in E33 are shown in figs. 3b and 4b. Here, the most parsimonious solution appears to be five clusters. Cluster 5 is dominated by microflint debitage, cluster 4 by micropottery, and cluster 3 by microbasalt. Bone and shell have high influence in clusters 1 and 2 but are relatively more important in cluster 2, which also has slightly

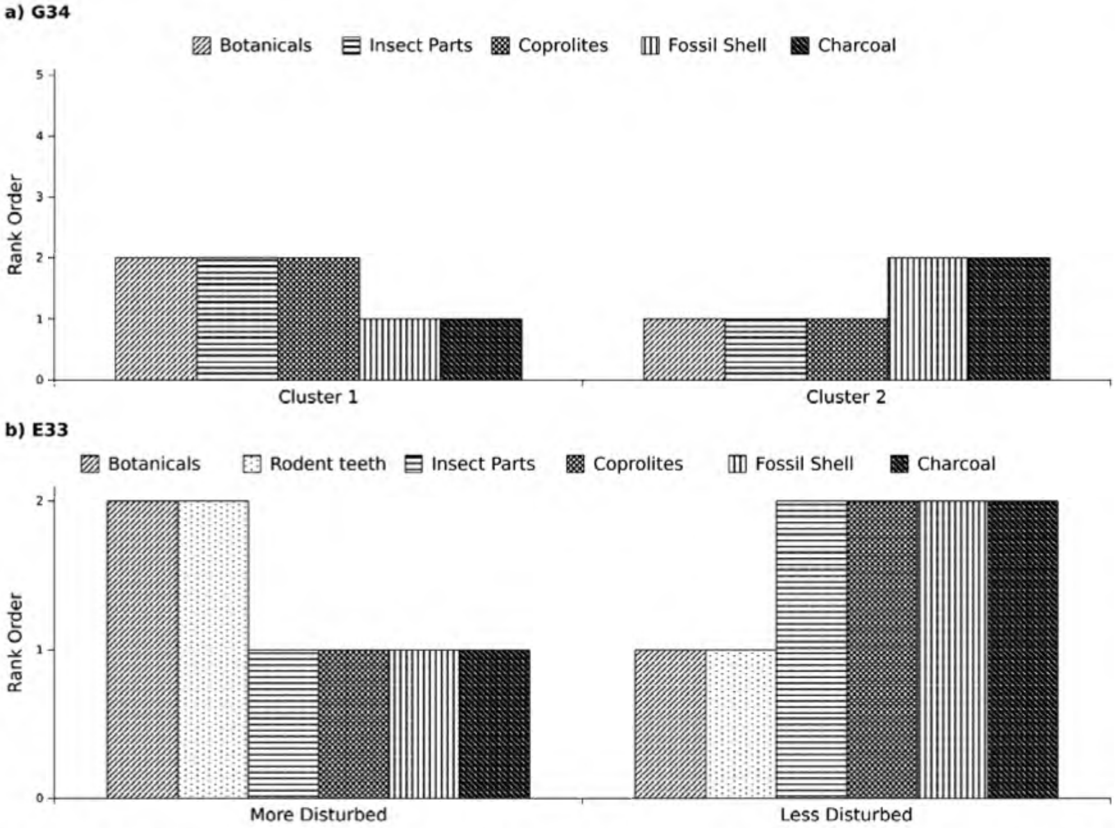

Fig. 5. Maps of cluster classifications for microecofact types for (a) the G34 floor and (b) the E33 floor.

higher amounts of microbasalt as well. Unsupervised classification of intrusive ecofacts helps to delineate more disturbed areas from less disturbed areas. In the G34 structure the main source of outside disturbance seems to be rodent activity, as indicated by the relatively high frequencies of rodent coprolites and intrusive botanicals in the southern portion of the building (figs. 5a and 6a). In the E33 house, we also discovered rodent teeth in addition to other microecofacts. Here, rodent teeth and intrusive botanicals correlate in high densities to indicate that the northern part of the floor has been disturbed by rodent burrowing (figs. 5b and 6b). Preserved intrusive rodent burrows are present in many sites in Wadi Ziqlab, including Tabaqat al-Buma (Kadowaki 2007).[7]

Discussion and Synthesis

Do these clusters actually represent the locations of real activity areas? To make this argument, one must link specific microrefuse cluster signatures with real types

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[7] The most likely culprits for this activity are subterranean Palestinian mole rats (*Spalax leucodon*). Mole rats frequently burrow in agricultural fields but are not known to live commensally in human houses (Qumsiyeh 1996). Therefore preserved burrows were likely dug after sites were abandoned and filled in by sediment.

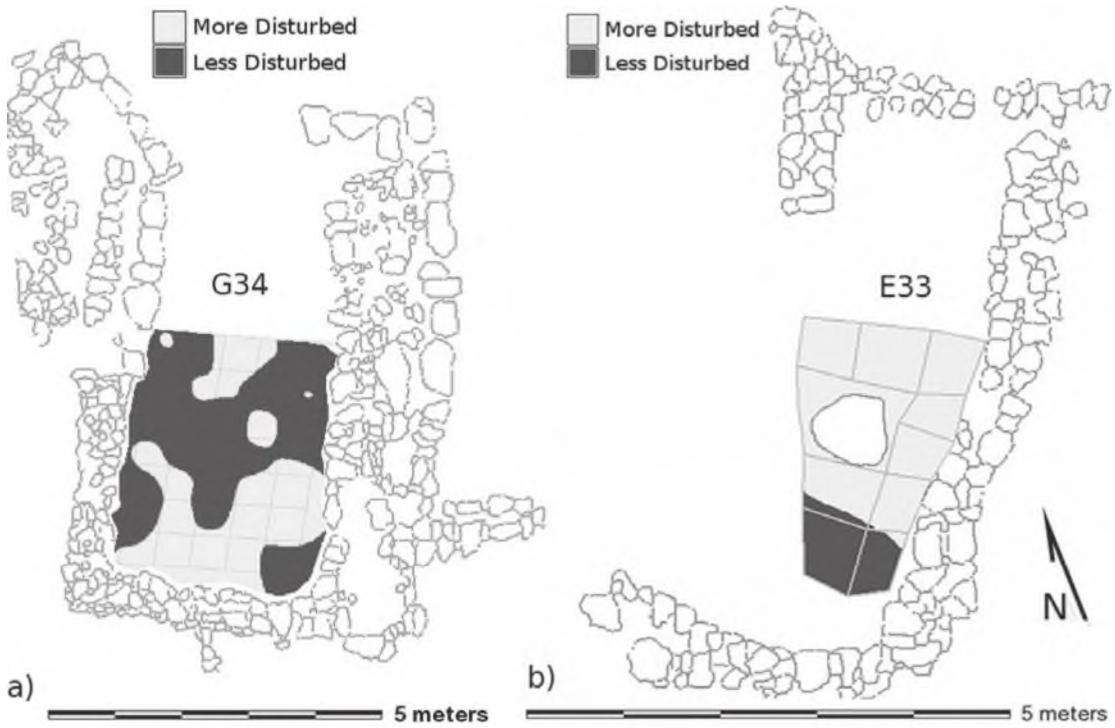

Fig. 6. Microecofact rank-order charts for cluster classifications for (a) the G34 floor and (b) the E33 floor.

of human activities. These interpretations are also greatly enhanced by ancillary evidence, including the spatial patterning of larger artifacts and the proximity of clusters to architectural features. Additionally, one must account for the effects of formation processes on the floor sediments.

Drawing heavily upon Kadowaki's (2007) spatial analyses of larger artifact types and architectural features, I developed several preliminary hypotheses about the use of space within both rooms before applying the microarchaeological data. The main architectural features of the G34 room are a plastered hearth, the threshold of what was most probably the main doorway, and a small anomaly on one wall that may indicate the presence of a window. Food preparation probably took place near the hearth, things were probably swept out of the door, and activities needing natural light probably took place near the door and window.

The E33 house is arranged differently. The central feature is a very large mortar and an open entryway, rather than a narrow doorway. While there is a small hearth in the building, it is currently unclear if it was in use during phase LN4 or is a remnant from an earlier phase. The closest large contemporaneous hearth seems to be located outside of the building and around the corner. Kadowaki (2007) determines that this was an exterior space during phase LN4. There is also an area of dense cobbles of unknown purpose—possibly a storage platform—in the southern portion of the room. Most food preparation may have taken place near the large mortar, and the use and maintenance of stone tools would take place near the entryway. It is possible that the small hearth was used for cooking, but its diminutive size and

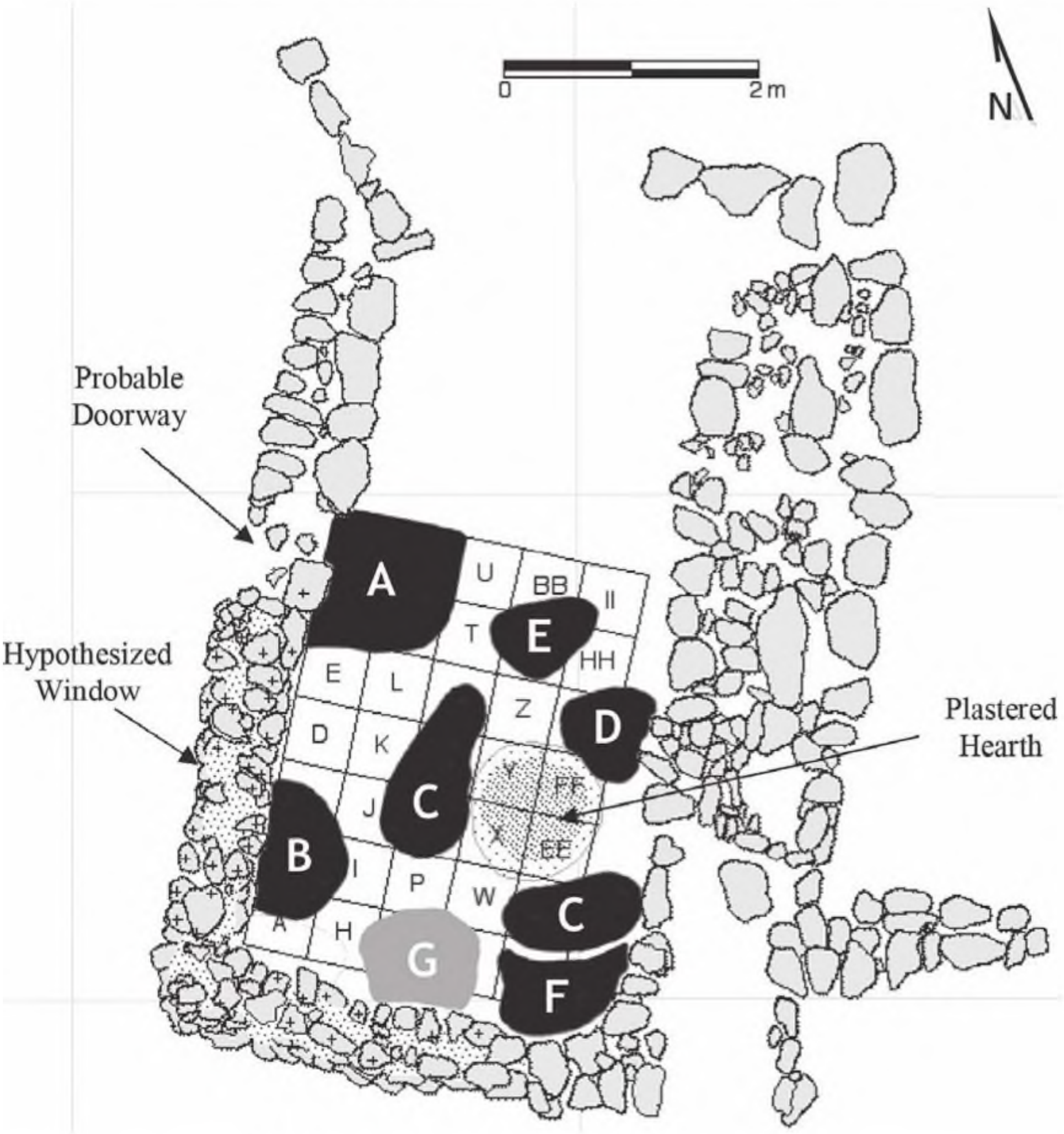

Fig. 7. Potential activity areas in the G34 room.

strange location suggest that it may have been a special-purpose hearth, perhaps for heating or hospitality. It follows then, that most routine daily cooking would have taken place around the corner at the outside hearth. Interestingly, the macro-sized faunal bones associated with this outside hearth are larger than average for the site, and there was moderately high density of sooty macrosherds and burned lithics in the hearth's vicinity as well (Kadowaki 2007).

Combining the architectural hypotheses with the results of the microrefuse analyses yields the following model of activity area arrangement inside the LN3 building in G34 (fig. 7). Area A is at the doorway, where people were probably manufacturing and/or using flint tools and basalt ground-stone implements, toward which rubbish from the rest of the interior space was swept, and where debris from outside the house was tracked-in. Area B is under the hypothesized window where people were probably also manufacturing or using flint tools and basalt ground-stone, but were also possibly processing shellfish. The two areas marked C to the west and south of the plaster hearth were probably used in the processing of animal remains, the use of basalt ground-stone tools, and were also the areas where meals were likely cooked. Area D is to the northeast of the hearth and was also probably used for food preparation and cooking. Adjacent to Area D is Area E, which was most probably used for discard of hearth debris, perhaps in the process of heat-treating flints, as indicated by high levels of charcoal and burned micro- and macro-artifacts.. The final activity area I identified, Area F, is the southeast corner of the house, which was likely used for flint flake storage or provisional discard.

Of the remaining portion of the sampled portion of the floor surface, Area G seems to have been highly disturbed and is characterized by low densities of artifacts but high densities of intrusive ecofacts. All other areas of the floor can be considered areas where activities that left no significant residues were performed, where large furnishings may have been placed, or where everyday cleaning significantly decreased the quantities of even small-sized artifacts.

A synthetic model for the positioning of activity areas in the LN4 floor of E33 is shown in fig. 8. Areas A and B, on the north side of the limestone mortar, seem to be where food preparation took place, with shellfish being slightly more important in Area A and animal bone being more important in Area B. On the south side of the mortar, Areas C and D seem to be related, respectively, to flint tool production or use and with the use or production of basalt ground-stone implements. It is unsurprising that there is evidence for grinding in Area D, given its proximity to the large mortar. Area C also has high amounts of micro-pottery, which may also indicate pottery storage or use here. This conclusion is corroborated by an abundance of larger pieces of chipped stone and potsherds recovered from the southern portion of the floor (Kadowaki 2007). High amounts of charcoal also occur south of the mortar, which is especially interesting, considering its distance from the small hearth.

Conclusions

Although some aspects changed through time, the residents of Late Neolithic Tabaqat al-Bûma seemed to have located a wide variety of activities within their main domestic spaces. The most consistent and readily apparent activities relate to the storage and processing of foodstuffs and the use, manufacture, and storage of stone tools. The continued practice of maintaining or manufacturing stone tools in domestic spaces is especially interesting, considering the hazard posed by lithic debitage. Another interesting trend between the two periods is the practice of provisional discard of hearth refuse inside domestic space rather than immediate removal to outside contexts. One potential explanation for the presence of provisional hearth debris discard could be the recovery of flints after heat-treatment.

The main difference between the two phases seems to be the removal of everyday cooking from the internal domestic sphere to an outdoor location. This change is evident in the constituency and patterning of microrefuse left on the two house floors. Architecturally, this change is exemplified by the replacement of the centrally located plastered hearth as the main domestic feature in the LN3 house G34 by a large, immovable stone mortar as the main domestic feature in the LN4 house E33

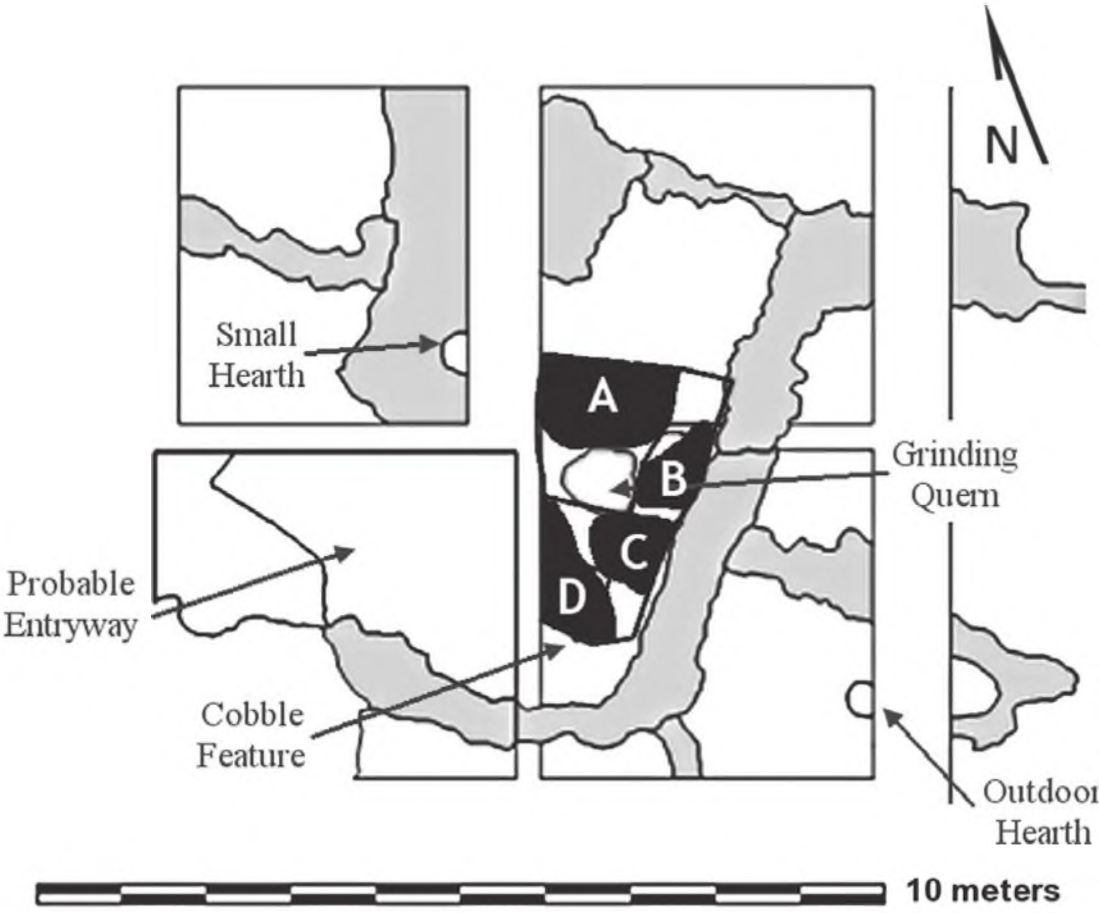

Fig. 8. Potential activity areas in the E33 room.

(Kadowaki 2007). Ethnographic study of traditional *tandir* bread oven use in southeastern Turkey has yielded several hypotheses about outdoor cooking areas. Parker and Uzel (2007) observed that some *tandir* ovens were placed in outdoor locations so that several neighboring families could share them. This helped families conserve fuel resources by scheduling multiple uses of the oven during a single firing and helped defray the expense and labor needed to purchase or build the oven. Additionally, placing the *tandir* outside helps keep domestic areas cool in the summertime. The LN4 outdoor hearth associated with the E33 house at Tabaqat al-Buma is likely too small to have provided much advantage through communal use, though cooking outdoors would certainly have helped keep interior spaces cooler in the summer.

There may have been another impetus for the shift in addition to the practical reasons just outlined. Shifting the locus of cooking from internal, protected space to external, openly visible space may indicate a change in the social dynamics of food-sharing and social cohesion at the site.[8] Ethnoarchaeological studies of food sharing among hunter-gathers show that the location of food preparation can have a direct influence over food-sharing patterns (Enloe 2003; Gurven et al. 2002; Kent 1993). Outdoor hearths are commonly associated with the sharing of cooked foods through what Kent (1993) calls "informal sharing," or what Enloe (2003) calls "tertiary sharing." Raw or unprocessed foods, on the other hand, are more likely to be shared through primary and secondary sharing (Enloe 2003), also known as "formal sharing" (Kent 1993). Primary and secondary sharing are usually related to social or merit conditions that obligate sharing and that shape and define the character of the act of sharing. Tertiary sharing—the sharing of meals—is less conscripted and therefore may be an important source of flexibility in food-sharing networks. The visibility of meal preparation is an important factor in the amount of tertiary sharing that occurs between potential sharing partners. Gurven (et al. 2002) shows that, in a sedentized community of formerly nomadic Ache hunter-gatherers in Paraguay, tertiary sharing of prepared meals was 2% higher between families that had good views of each others' food preparation areas than between families that had poor views of each others' cooking area. The emergence of food-sharing networks in small-scale agricultural communities is often seen as a form of social insurance that spreads risk when resource abundance varies unpredictably through time or space (Hegmon 1991). If this is the case at Tabaqat al-Buma, then it may demonstrate that agricultural returns were diminishing, perhaps due to increased human pressure on the local environment.

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[8] Interestingly, the opposite trend occurred in the preceding PPNB period at sites such as Beidha, where the location of domestic activities such as cooking and eating seem to have moved from exterior to interior spaces through time (Byrd 1994).

The analyses presented in this essay underline the importance of extensive spatial microartifact collection procedures. Data thus collected allow for a richer and more nuanced understanding of room use, and may even allow for the differentiation of habitually-used activity areas within rooms. Grid-based collections methods, like those employed at Tabaqat al-Buma, may not be the best collection method for the construction of the type of interpolated density maps used in this chapter, however, because all later analyses are ultimately subject to some of the intrinsic errors associated with grid-based methods. Collecting many small spatially discrete samples from the nodes of a lattice is likely to be a better method, and future work I undertake will employ this collection methodology.

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Household Matters: Techniques for Understanding Assyrian Houses

Lynn Rainville

Introduction

My work is based on two assumptions: (1) the everyday lives of individuals, regardless of class, are relevant for understanding broader socioeconomic and political processes, and (2) the built environment is both the arena for, and a participant in, the construction and conveyance of culturally specific ideas and beliefs. Two hurdles have prohibited researchers from fully exploring these ideas, leaving a gap in our understanding of domestic economies. First, domestic structures can be difficult to locate and expensive to excavate on a large scale. Second, material and behavioral analyses within domestic structures are more difficult to interpret than commonly assumed. Archaeologically, houses are marked by the presence of certain artifacts (grinding stones and cookware) and features (hearths). However, the debris left by activities performed within houses is usually disturbed and often discarded far from the loci of activity. In this essay, I review methods that can be applied to the study of households and refine a new technique for recovering evidence of everyday life: micro-archaeology or micro-debris analysis.

Everyday Life in Assyrian Cities

The last decade of archaeological theorizing exhorts us to put faces on the people of the past, to consider their identities and personalities, and to attribute agency to non-elites (Ambridge 2007; Gillespie 2001; Robin 2001; Tringham 1991). Nonetheless, little is known of the everyday life of Assyrian commoners or of the domestic unit. The infrequent studies of Mesopotamian households have tended to focus on the houses of the elites, including palaces, large estates, and temples (Delougaz et al. 1967; Henrickson 1982). Many Assyrian sites contain houses, but they have either not been the focus of investigations or too limited a number of domestic structures have been uncovered, making it impossible to talk about patterns in daily actions. We lack a comprehensive study of ordinary Assyrian homes. The first step to achieve this goal is to refine our methods for collecting artifacts from urban sites.

It can be difficult to flesh out the dead on the basis of the material culture they used each day; we often begin with little more than pieces of broken cook-pots and debris from sharpening lithic knives. But I do have some suggestions for interpreting artifactual remains from urban households. I will limit my observations to urban houses, leaving out the rich archaeological and ethnographic data from settlements of a different scale because urban excavations present a unique series of challenges, such as recording collection spots for artifacts over dozens of meters and trenches and sieving huge quantities of dirt.

In archaeology, much of the study of everyday life revolves around the domicile, the center stage for many of the activities undertaken by average citizens. Thus, a robust approach to household archaeology in Assyria should incorporate methods for studying everyday life. As Pader (1993) explained, "[T]o understand the power of domestic space as a social construct, one must look beyond ritual action and grand cosmological belief systems and into the practical actions of daily life." Below, I outline methods for accomplishing this goal.

To do so, I will use observations from the six seasons (2002–2007) that I spent as the assistant director of excavations at the site of Ziyaret Tepe in southeastern Turkey. In my managerial role, I had the opportunity to visit each operation at the site and observe a range of techniques. I also had input into and knowledge of the excavation strategies. My other role was to direct the collection and analysis of microarchaeological samples. These two roles gave me a good overview of the challenges of collecting and processing more than 1,000 samples from multiple contexts.

Household Archaeology: Overview of the Field

Richard Wilk and William Rathje first introduced the term "household archaeology" in a 1982 article by the same name.[1] It is surprising that this subfield did not develop at a much earlier date, since all settlements have houses, even if they vary in size, permanence, materials, and function. Prior to this seminal article, archaeologists had excavated houses, and some even called attention to the importance of analyzing household activities (Flannery 1976), but Wilk and Rathje opened up a more focused discussion and suggested that archaeologists compare houses from all over the world. Today this subfield is referred to as "domestic archaeology" or "household archaeology."[2] Part of the widespread appeal of household archaeology is that, no matter what your theoretical perspective, "the household reveals relationships of thought and substance that can aid immensely in understanding the past" (Deetz 1982: 724).

Almost three decades after Wilk and Rathje's defining article, most archaeologists recognize that households are the fundamental economic and social building-blocks of society. And yet they are often considered of little importance in traditional urban research designs and, subsequently, in interpretations of socioeconomic relationships within the state. As Tringham (1995: 79) succinctly phrased it a decade ago (original emphasis):

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[1] Richard Wilk and William Rathje, "Household Archaeology," *American Behavioral Scientist* 25 (1982) 622–31.

[2] While the results of more than two decades of household research are summarized in a variety of articles, only a very small subset is cited here: Allison 1999; R. Beck 2007; Casteel 1980; Flannery and Marcus 2005; Hendon 1996.

> We [archaeologists] write a lot about *architecture, spatial patterns, buildings dwellings, shelters*, and we make inferences about *houses*. Only recently have we even begun to make explicit inferences about *households*.

While there have been dozens of articles and books that have addressed this topic since, the domestic realm is still often considered distinct and theoretically inferior to the study of politics or economies. The lack of synthesis among these arenas may in part be due to the difficulty in identifying the boundaries between and among the physical structures that make up ancient houses. Another source of confusion lies in the terminology: the shared activities of the *household* are often separate from the physical structure of the *house*, which, in turn, is separate from the kinship relations among the *family*. Unfortunately, these three terms are often used indiscriminately and serve to confuse the form, function, and activities associated with each. Accordingly, I suggest working definitions for each that will serve as the foundation for my discussion of domestic activities.

Household Archaeology Terminology

Houses

Across cultures, houses serve multiple functions: as a shelter from the elements, a social gathering space, and as the center for daily economic activities. Despite these universal aspects, house-forms vary according to the climate, available building materials, cultural preferences for design and architectural forms, and the resources of the house owner. Most houses contain a mixture of public and private areas that are variously used for work, play, sleep, socializing, storage, and the performance of religious rituals. The maintenance of the house is a daily chore that includes sweeping, cleaning, trash disposal, and (less often) rebuilding and adding or deleting rooms. Most spaces within the house are multifunctional and serve as the stage for multiple activities (Horne 1994; Kramer 1984). Moreover, domestic activities can take place in both interior and exterior spaces, including associated courtyards, streets, and roofs (Rothschild 1991).

Recently, there has been a resurgence in studies of "house societies."[3] Although not focused solely on "houses," this approach builds on Lévi-Strauss's conception of the house as a "moral person" (*personne morale*) and views the house as a multigenerational social institution. Archaeologists have used this approach to transcend static and taxonomic approaches to kinship, social structure, and the materiality of the house. While there are weaknesses in Lévi-Strauss's approach, this broad definition of "house" and its social context can help archaeologists model sociopolitical transformations (Gillespie 2000).

Households

Whereas the domestic structure is often recognizable by the presence of certain artifacts (grinding stones, utilitarian pottery, and cookware), features (hearths and middens), and architectural patterns (mud-brick walls constructed on stone foundations), defining household membership and activities is more difficult. The term "household" refers primarily to shared activities and residence (Netting et al. 1983: 20). These shared activities include biological and social reproduction, agricultural and craft production, food-sharing, and the transmission of property, rights, ideologies, or roles (Wilk and Rathje 1982: 622–31). There is tremendous cross-cultural variability as to what level and where these shared activities occur. Hammel (1980: 251) synthesized the nature of the household as the "smallest social group that participates in the maximum number of functions." If this is an accurate definition of the household's role, the spatial configuration of household activities should provide insight into its economic, social, and political organization.

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[3] Such as the 11 articles in Janet Carsten and Stephen Hugh-Jones, eds., *About the House: Lévi-Strauss and Beyond* (Cambridge: Cambridge University Press, 1995).

Families

While a household may include unrelated individuals, the family is traditionally defined as a group of people related by descent or marriage. But a family may or may not share a residence. Unfortunately, analyses of "the family" are often ignored in the study of state-level societies because of a prevailing assumption that kinship relations are no longer central to economic or political goals in these societies (Wirth 1938). To the contrary, I would suggest that there is no absolute dichotomy between kin-based and non–kin-based societies. Rather, kinship forms the basis of social relations within all types of societies (Yoffee 1997: 262). Unfortunately, this basic social unit is very difficult to observe in the archaeological record because most family units diverge over time, decentralizing the physical location of kinship ties.

Household Activities

To focus more clearly on the archaeological contributions to the anthropology of households, I define a fourth focus for the study of domestic relations: household activities. Archaeologists can outline the size and form of houses, but the other two domestic groups, households and families, can only be indirectly inferred from material culture, house dimensions, and ethnographic analogy. Household activities are one of the more direct inferences that archaeologists can make about ancient homes. Fortunately, many ancient technologies are subtractive: processing lithic tools removes flakes to produce a sharp edge; preparing meals involves the dissection of animal carcasses and often deboning of pieces of meat; plant processing entails the removal of inedible portions. These chores leave behind material traces. Other common daily activities, such as washing food bowls, preparing stews in cooking pots, sewing clothing, can often lead to unintentional breakage or loss. In this article, I will focus on methods for retrieving information about this level of everyday life.

My final observation is that the field of "household archaeology" is too narrowly interpreted. Households contain evidence of religious worship, economic transactions, gendered relations, political affiliations, and socioeconomic status. Fine-grained archaeological methods are required to retrieve this information, but it is important to develop research agendas that can gather and interpret this data. As just one example of the multi-dimensionality of lived experiences within households, we should reassess the presumed dichotomy between "public" and "private" spheres. Even decades after feminist critiques and insights, many archaeological models associate men with the public domain and women with the domestic (Pyburn 2008: 115).

As a result, "women's work" is considered irrelevant to the non-domestic sphere. As Silverblatt (1995) correctly observed, even in state societies, men's and women's lives do not neatly fall into categories of public and domestic spheres. An example from the 18th-century parish in Santa Catarina, Mexico, demonstrates the overlapping nature of domestic and public spheres, where "women were more often than not heads of households and principal providers . . . [and thus] . . . homes functioned as both domiciles and work sites, while work sites, like factories, also functioned as nurseries" (Silverblatt 1995: 642). Moreover, gender can only be understood as a social category within other social identities, including class, religion, and ethnicity. Thus, an understanding of daily activities or household composition and management is a necessary component for understanding the functioning of these ancient societies at both the domestic and political level.

Household Techniques

Archaeologists have applied numerous techniques to the study of houses. The most basic is an architectural approach that seeks to define the form and boundaries of a house (Gnivecki 1987: 187–89; Postgate 1992: 89–92). While simple in concept, the on-the-ground interpretation of densely-packed, often contiguous urban households is more difficult. Once the edges of a building have been determined, there are more sophisticated tests that can be conducted to demonstrate access routes throughout the house, high traffic areas, and, conversely, private rooms and space syntax (Hillier and Hanson 1984). We can also study recurring domestic features to identify architectural patterns. For example, a study of traditional Ottoman houses in north-central Turkey revealed several recurring domestic forms: bathing areas (*gusülhane*), fire places (*ocak*), bathing rooms (*hamam*), cantilevered rooms, and latticed windows (Kamil Yaçin 1998: 92).

A complementary approach—activity-area analysis—was spearheaded by Kent Flannery (1976: 34–47), Susan Kent (1984), and others, such as Lewis Binford (1978: 330–61), in the 1970s and 1980s. This approach studied the distribution of daily actions within and outside of buildings and included the identification of flint knapping locations and cooking facilities among other chore-oriented spaces (Behm 1983; Gnivecki 1987). Kent argued that the use of space conveyed information about more than simply daily activities. Instead, the distribution of activities affected the design of architecture and, in turn, illustrated cultural values (Kent 1990: 1–8). This technique is not unique to "household archaeology," but when applied specifically to households it helped archaeologists move beyond an architectural approach.

When left *in situ*, certain artifacts and features can help identify ancient activity areas. However ethnographic observations demonstrate that few features permanently mark the location of past activities. For example, spinning and carding wool may be unobservable in the archaeological record: spindle whorls, rarely left *in situ*, are used to spin the wool, and the loom is often portable and leaves behind only small postholes that are quickly refilled (note: the loom weights might be left behind). Similarly, the area where food is consumed might be hard to recognize archaeologically: the cups and bowls from a meal might be stored in the kitchen rather than in the room where consumption occurred. Exceptions to these nomadic macro-artifacts are features such as hearths, bread ovens, drains, and large artifacts such as grinding stones or door sockets. In addition, a limited number of activities take place in marked-out areas: threshing (in packed-down threshing floors, as large as 30 ft. in diameter), cooking (in ash-filled hearths or ovens), and grape processing (in large vats stained with tartar residue; Horne 1994: 96). A further complication in identifying activity areas is the changing use of rooms depending on the time of day and the seasons. Because of these difficulties in locating primary deposits of macro-artifacts, archaeologists rarely succeed in mapping the distribution of activities within houses, except in the rare cases where everyday household artifacts were left behind in a burning building, such as House 1 at the third-millennium B.C.E. site of Tall Bderi (Pfälzner 1993: 118–22), second-millennium Tel Halif (Hardin, chap. 20 below), and fifth-millennium Kenan Tepe (Parker, chap. 12 below).

To aid archaeologists in doing activity-area analysis, it is often combined with another method: ethnoarchaeology. Since the intangible social relations associated with "households" are often more fully understood through ethnographic comparisons, careful analogous reasoning between the ethnographic present and the archaeological past is important. Archaeologists and ethnographers have correctly warned about the uncritical superposition of contemporary actions and artifacts onto a distant past.[4] Instead, we can follow Penelope Allison's guidance and use ethnography as "a *signifier* of complexity rather than a *prescriber* of household behavior" (Allison 1999: 3). Another important criterion for using analogous reasoning is to compare similar settlement types. In the 1960s and 1970s, much of the ethnoarchaeological work in the Near East was conducted in villages (Hopkins 2003; Koşay 1977; Kramer 1982; Watson 1979). Contemporary rural settlements are not the best parallel for studying daily praxis in a densely populated ancient city. New studies of traditional contemporary cities would shed better light on the possible longevity of urban behaviors. Finally, ethnoarchaeology is best suited for the study of processes in the life cycle and abandonment of buildings or sites and for the analysis of unchanged technologies (such as mud-brick construction using wooden brick-molds). With these caveats, we can use ethnographic analogies as an analytical tool (LaMotta and Schiffer 1999). For example, recent ethnographic research into *tannur* construction and replacement demonstrated that the core of the bread oven needs to be replaced every two to three years (Yakar 2000: 153). A follow-up ethnoarchaeological study of *tannur*s in the region surrounding Ziyaret Tepe revealed that seven to eight families might share a single neighborhood oven (Parker and Uzel 2007: 16). This scenario is not always considered when the ruins of multiple bread ovens are uncovered in proximity to each other. Instead, a more common interpretation, due to the multiplicity of ovens, is that it was a "workshop," producing beyond the household needs. Contemporary bread-making strategies may not be identical to past skill sets, even though the form of the oven is similar, but we can use these ethnographic observations to challenge our unidimensional interpretations of the archaeological record.

A fourth technique used to study houses is ethnohistory. When studying historic households, textual evidence is a useful supplement to the archaeological evidence of past behavior. Although written evidence can misrepresent, exaggerate, or ignore elements of human behavior, a close reading of ancient texts paired with artifactual data can provide insight into daily actions. Several Near Eastern scholars have relied almost exclusively on written documents to produce interesting accounts of everyday life. For example, Jean Bottéro (1992: 50–51; 2004) translated Akkadian texts to derive recipes for Mesopotamian dishes, including references to a "cooking pot," the preparation technique (e.g., roasted or boiled), and even a term for the artisans who prepared the dishes (*nuḫatim-mu*). A more interdisciplinary approach was taken by Elizabeth Stone (1987) at Nippur and by Stone and Paul Zimansky (2004) at the Old Babylonian city of Mashkan-shapir.

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[4] For a full discussion of this topic, see David and Kramer 2001: 12, 33–61.

While these literary accounts provide insights into daily actions, historic texts are often biased toward the lives of the elites. Thus, much of our textual evidence for furniture, house form, material culture, household rituals, and marriage customs pertain to the wealthy. For example, much of the content in Nemet-Nejat's chapter on "Private Life" in her book, *Daily Life in Ancient Mesopotamia,* comes from esoteric law codes, religious texts, and elite letters (1998: 121–62). Still, this rich material can provide models of an idealized domestic pattern that can be tested against the archaeological record.

For any of these techniques to be successfully applied, we must consider the impact of formation processes on the domestic structure and its associated artifacts and features. Pioneered by Michael Schiffer, this approach urges archaeologists to remember that all houses undergo natural and cultural transformations, including destruction (intentional and not) and the removal of artifacts (e.g., curation; Schiffer 1972, 1983). These processes can occur at the macro-level, with fires, structural collapse, or flooding, or at the micro-level, with the removal of food remains by ants or rodents who burrow through layers.

A consideration of formation processes leads us to the last method considered here, micro-archaeological techniques. The study of micro-artifacts (and variously referred to as micro-debris analysis, micro-archaeology, or micro-artifact studies) is a growing field. There is no agreed-upon terminology or methodology, but the study of small artifacts (from microscopic, under 1 mm, to as large as 3 cm) is based on the premise that traditional dry sieving is not the best method for recovering small artifacts. Such "micro-debris" may provide information about activities that did not leave traces in larger artifacts or preserved features (Cameron 1991). While large objects may be scavenged, discarded, or curated in periods of abandonment, smaller debris is often swept into corners or trampled into the surface of a floor or courtyard in an ancient community (Deal 1995; Matthews 1995). Often left behind by traditional sweeping techniques, micro-artifacts provide a window into the debris left by repeated actions. Moreover, because of their small size, they are unaffected by many of the postdepositional factors that commonly act upon larger remains (Rosen 1986; Stein 1987). Because of these attributes, I focused my research at Ziyaret Tepe on the unintentional deposition of micro-artifacts.

I developed a sampling procedure for collecting micro-artifact samples (Rainville 2005: 17–36). Micro-archaeology relies on a combination of judgmental and random sampling techniques to balance recovery with the time consuming nature of sediment collection and micro-artifact sorting. On one hand, I made a deliberate effort to collect samples from a wide range of locus types at Ziyaret Tepe. On the other, I also randomly sampled large horizontal exposures of floors and, occasionally, targeted specific locations within these rooms, such as thresholds, areas adjacent to fixed features, and areas of dense macro-artifact scatters. These samples were collected from discrete loci as "whole earth" or "sediment" samples. Both large and small artifacts were collected, enabling a comparison of macro- and micro-artifacts from each find-spot. If there were no difference, it would signal that micro-artifacts were just broken bits of larger things, thereby negating the utility of the method.

After collection in the field, the samples were floated with a mechanical flotation machine (fig. 1). The "light fractions" (containing botanical matter) were set aside for analysis by the botanical specialists. The materials left over from flotation are referred to as the "heavy fractions." With a mechanical flotation device, the velocity of the water is sufficient to dissolve all but the hardest clays. After the remaining debris dried, the resultant rocks and artifacts were sifted through a series of four bronze screens of variable mesh: 6.30 mm, 4.75 mm, 2 mm, and 1 mm. This size-sorting greatly aided identification and separation of the archaeological remains from pebbles. With the aid of a 3.5× magnifying binoculars, delicate tweezers, and large sorting trays, I picked out pieces of pottery, bone (animal and human), chipped and ground stone, baked mud brick and plaster, shell (both aquatic and terrestrial), bitumen, charcoal, and the less frequent bead, token, piece of bronze, or bit of sealing clay (fig. 2).

After returning from the field, I calculated the weight and count density for each type of debris to produce comparable densities. The densities were calculated as the ratio of the number of individual artifacts (such as sherds, bones, and lithics) divided by the total amount of unfloated sediment (in liters). These densities were mapped onto site plans and visually inspected. The data were also entered into a computer statistical package (SPSS) and analyzed with a variety of nonparametric tests of association.

In addition to studying the density of micro-debris types at each locus, the artifacts were sorted into finer categories, including ceramic wares (fine, sandy, coarse, and cooking), biological taxa (including fish, medium and large mammals, and rats and mice), chipped stone colors that corresponded to macro-lithic tool types (tan, dark brown, gray, and the less common pink or red), and shell (aquatic and terrestrial). This qualitative sorting more precisely revealed different ancient activities. For example, the co-occurrence of a cooking ware with burned, nonintrusive mammal bone strongly suggested that the correlations resulted from specific culinary activities.

After setting up the flotation device and gathering the materials necessary to process the samples (such as sealing bags, Munsell color chart, tweezers, and sieves), the average sample (consisting of 5 liters of sediment) took about an hour to process. This estimate includes the time to collect the sediment, float it, pick through the heavy fraction, count and weigh the micro-artifacts, and qualitatively sort the artifacts.

Problems with Studying Households at Urban Sites

The techniques discussed above can be usefully applied at most sites, but large urban sites present a unique set of challenges. Below I outline five observations that complicate the recovery of household data from ancient cities.

The first observation is obvious but often forgotten in the long process from field recovery to final interpretations. Most of the household artifacts that we recover are

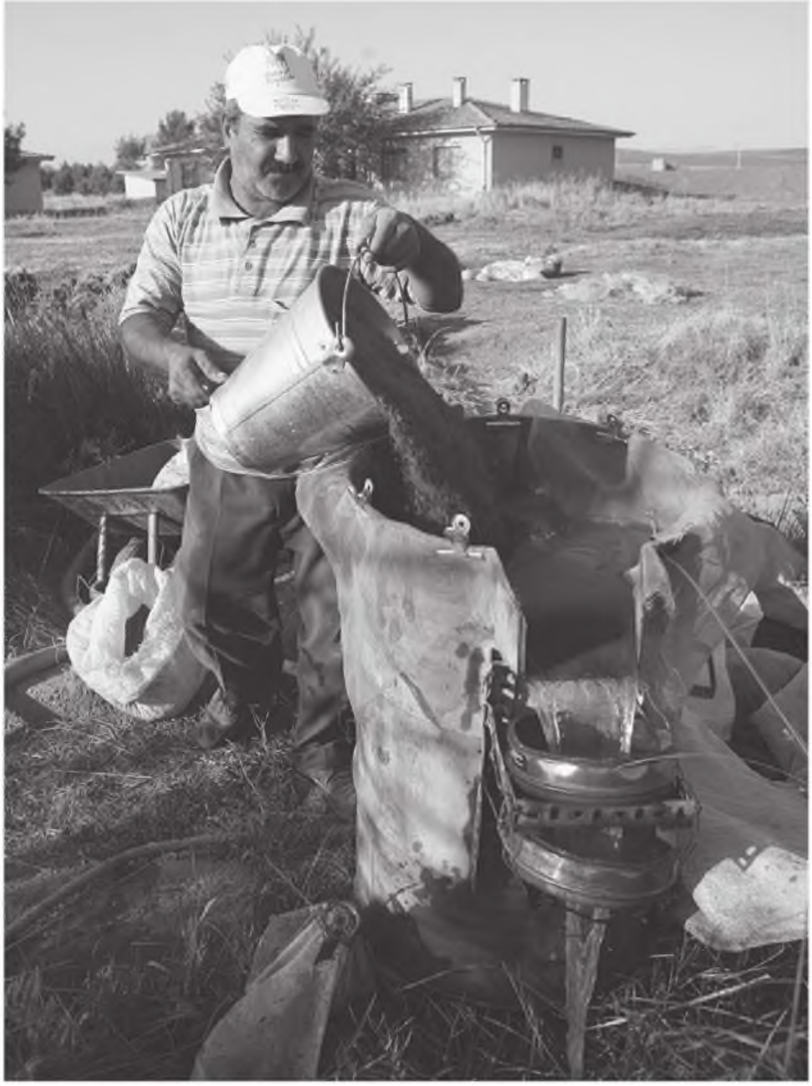

Fig. 1. Suphi Kaya Bey demonstrating the Ziyaret Tepe flotation machine. The bucket contains the heavy fraction; the light fraction is collected in the two sieves; the remaining heavy fraction is cut in the large wire mesh. Photographer: Jerzy Wierzbicki. Courtesy of the Ziyaret Tepe Archaeological Project.

from the final stages of building use. The exceptions occur when a building is burned, with belongings left *in situ* (albeit burned), or when a building is abandoned due to a sudden departure, leaving household items behind unintentionally. We know of these rare exceptions, but it is still tempting to interpret the more frequently found layer of smashed vessels on a floor as an activity area. One could imagine other explanations, such as a collapsed roof smashing the contents of *in situ* storage vessels, but by this time in the building's history it was either structurally unsound or decayed from having undergone a period without upkeep. In either case, the circumstances are unlikely to provide a window into the successful operation of a household.

My second, related observation is that at most urban Near Eastern sites we do not have the luxury of peeling off micro-layers of dirt and assigning precise dates to room floors. As a result, in a complex and stratigraphically deep urban site, we rarely excavate "a day in the life of a household." Rather, we uncover the accumulation of years, if not generations, of everyday actions. Again, we know that sudden events,

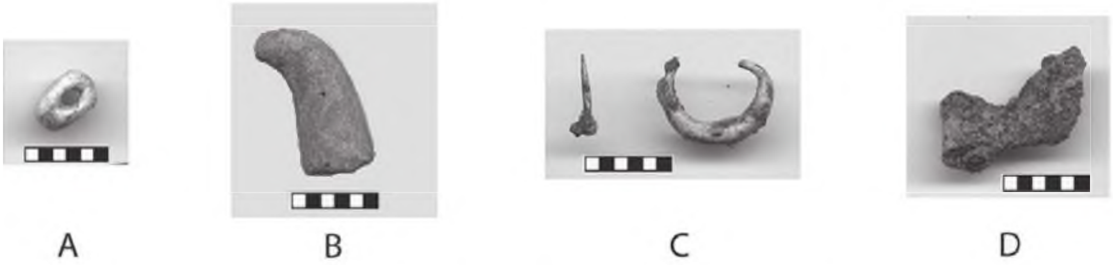

Fig. 2. Micro-artifacts recovered from heavy fractions. (A) an oblong bead, (B) an unusually shaped token, (C) a bronze hinge, (D) a bronze pin and earring. Scanned by Lynn Rainville. Courtesy of the Ziyaret Tepe Archaeological Project.

such as fires, floods, or attacks, did occur, and they can give us a more precise window into an event, however most ancient households were gradually abandoned, remodeled, or reused for other functions (such as animal storage or trash disposal).

In contrast, annual and even seasonal studies of household activities have been conducted in other regions of the world (e.g., in the American Southwest and the Mayan region; see Lightfoot 1994; Robin 2001). Large-scale excavations that seek to uncover variability in urban lives usually have to select one of the following goals, based on time and money constraints: a large number of small exposures (e.g., 5 × 5 m trenches) or a limited number of horizontally expansive trenches (e.g., 20 × 20 m). Each strategy has its merits, but each approach sacrifices some degree of insight into ancient households. Smaller trenches are unlikely to expose a complete historic Mesopotamian house, while large trenches usually expose multiple houses but from a fewer number of areas throughout the site. Urban models from a variety of periods and geographic regions reveal that many ancient neighborhoods were heterogeneous, sometimes in terms of occupation and other times by class or ethnicity. If we hope to understand "everyday life" in an ancient city, we need to sample from each of these neighborhoods.

A third problem is that only a handful of urban excavations in the Near East have had a stated goal of studying households.[5] This has been especially true for Assyrian cities. For example, in the 19th century, after excavating Nineveh, Austen Henry Layard concluded "we have no means of ascertaining the nature of the private dwellings of the Assyrians. . . . No such houses have been preserved . . . their complete disappearance being attributable to the perishable materials of which they were constructed" (Layard 1867: 339, 372). The index of his 377-page book contains only one other page cited as dealing with "houses." More than one hundred years later, non-domestic questions continue to guide research at many ancient Assyrian cities. These worthwhile approaches include the study of elite lives (and their deaths), the nature of urban ideology, and how political institutions such as the temple, palace, and large, private households functioned. The end result is, unintentionally, a gap in our knowledge of Assyrian houses. For example, a recent book on Nimrud that surveys decades of archaeological work at this Assyrian city does not contain the word "house" or "household" in its index (Oates and Oates 2001: 135–39, 304).

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[5] Two notable exceptions include Stone 1987 and Einwag and Otto 1999.

Moreover, the one chapter partially dedicated to "private houses" follows an older schema that focuses on elite households and their role as either "institutional and communal" (e.g., Diakonoff 1974; Liverani 1984) or "institutional and private" (e.g., Gelb 1979; Renger 1973). Both perspectives focus on the productive capacity of these institutions rather than their function as private residences of ordinary people. The complexity of excavating a large urban site means that even something as culturally basic as "homes" can be overlooked when devising a research agenda. This leaves us with an incomplete understanding of ancient citizens and their role in creating, maintaining, and protecting their cities.

My fourth observation is that we should use ethnoarchaeology to create models for testing the recoverability of everyday life from the archaeological record. It is well documented that contemporary life in Turkey is culturally, ethnically, and religiously distinct from the Assyrian period. Nonetheless, some technologies (small-field irrigation techniques and mud-brick molds), artifacts (glass beads), and features (tannurs) remain in use, especially in rural areas. The challenge is to avoid simplistic interpretations that project contemporary rural communities back two thousand years into the past. Instead, I suggest that we use ethnographic observations as a basis for compiling attributes to test for in the archaeological record and to investigate formation processes.

I have devised several models for what we might expect to see in the archaeological record of Assyria that are based on a contemporary walled city located 50 km from Ziyaret Tepe. The city of Diyarbakır is itself very old. During the 1st millennium B.C.E., it was the Assyrian city of Amedi. Later colonized by the Romans, Persians, and finally the Muslim Arabs, Diyarbakır became the capital of the Ottoman Empire in 1516 (Başgelen 2000). Today it is the center of a Kurdish region in Turkey. More than half a million people live within the city. Despite the dense population, elements of the old basalt walls still stand in a 5.5 km circle around the city, supplemented by 5 gates and 16 keeps. Inscriptions and bas-reliefs illustrate the changing ethnic composition of this city over the centuries.

During my own trips into Diyarbakır from our nearby site, I spent hours walking the streets and creating hypotheses for understanding the patterning of material culture within the ancient streets and buildings that we were excavating at Ziyaret Tepe. During one of these trips, I photographed a contemporary urban market (fig. 3). The photograph depicts a partially covered outdoor market within the walled city. A cobbled street runs down the center of the market, with a flat trough down the center to permit the easy removal of water and waste. What is most interesting to me is the contrast between activities that do preserve materials and those that do not. A thousand years from now, we would expect to recover remains from the clay-based street, the drain, the foundations of the walls that delineate shops, some roof material (collapsed and mixed in with the debris from the walls and floors), and maybe some scraps of metal or plastic, left behind whenever the market, or city, was abandoned. We would not find the stools that encouraged impromptu conversations and business deals, scattered along the street; the tea boy who regularly surveyed the shops hoping for customers; the artifacts associated with the shops; the money the shopkeepers kept either on their person or in a safe place; and the daily interactions among people. In the next section, I will apply these considerations to an investigation at one Assyrian city: ancient Tushhan, modern Ziyaret Tepe.

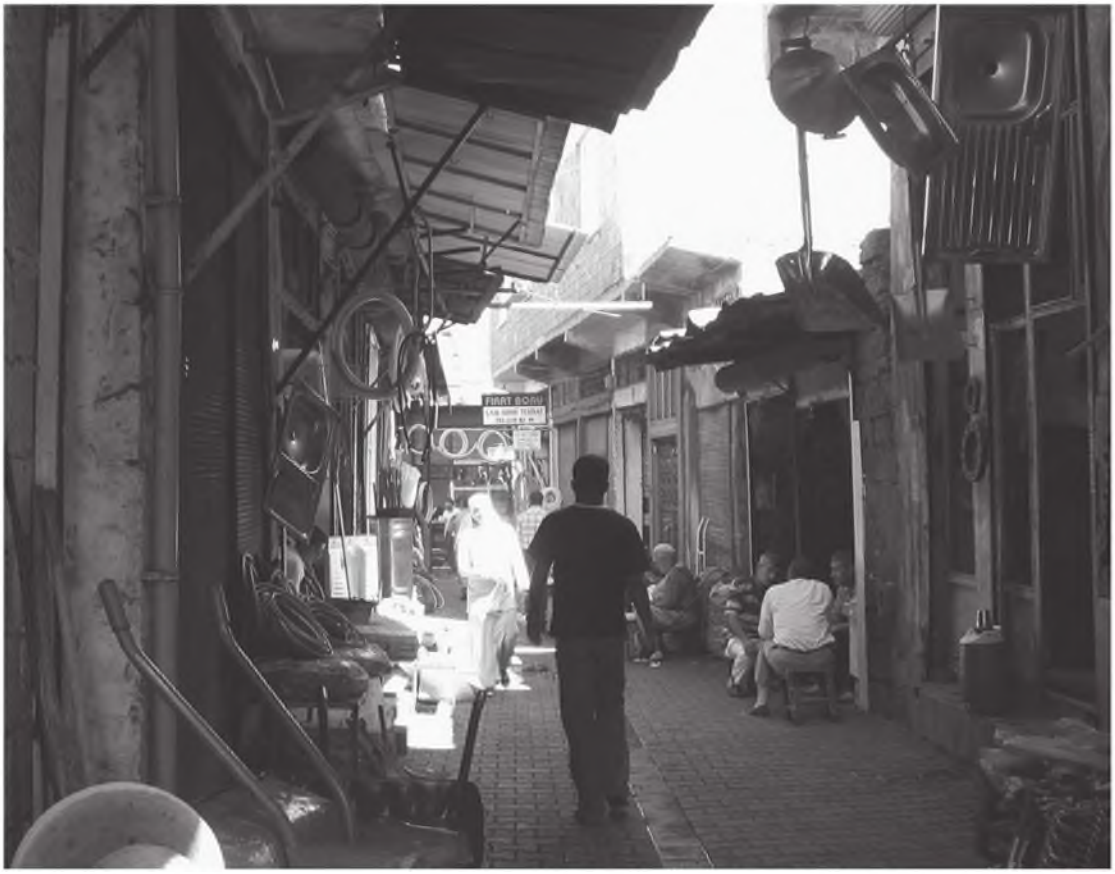


Fig. 3. An outdoor market, Diyarbakır, Turkey. Photographer: Lynn Rainville.

A Brief History of Ancient Tushhan (Modern Ziyaret Tepe)

Located along the upper reaches of the Tigris River, in the Diyarbakır Province of southeastern Anatolia, ancient Tushhan was an important independent city-state as early as the early 2nd millennium B.C.E. The site covers about 32 ha (fig. 4). The Ziyaret Tepe Archaeological Project was begun by Dr. Timothy Matney in 1997 as a salvage project necessitated by the proposed construction of a hydroelectric dam downstream on the Tigris River. Excavations started in 2000, and consecutive field seasons were conducted for six summers, culminating in two study seasons. The site includes two sections: a high citadel and an expansive surrounding lower town. From the beginning, the overarching research goal of the Ziyaret Tepe archaeological project has been to understand the nature of urban life in antiquity. From magnetic surveys, we learned that the site contains several urban features, such as a city wall, city gates, large roadways, and several monumental buildings (Matney and Somers 1999; Matney et al. 2003; Matney and Rainville 2005). From texts, we learned that Assurnasirpal II (r. 883–859) targeted this city for renovation. A stele found in the Ninurta Temple in his capital city Kalhu (modern Nimrud) reads: "I took Tushha in hand for renovation. I cleared away its old wall, delineated its area, reached its foun-

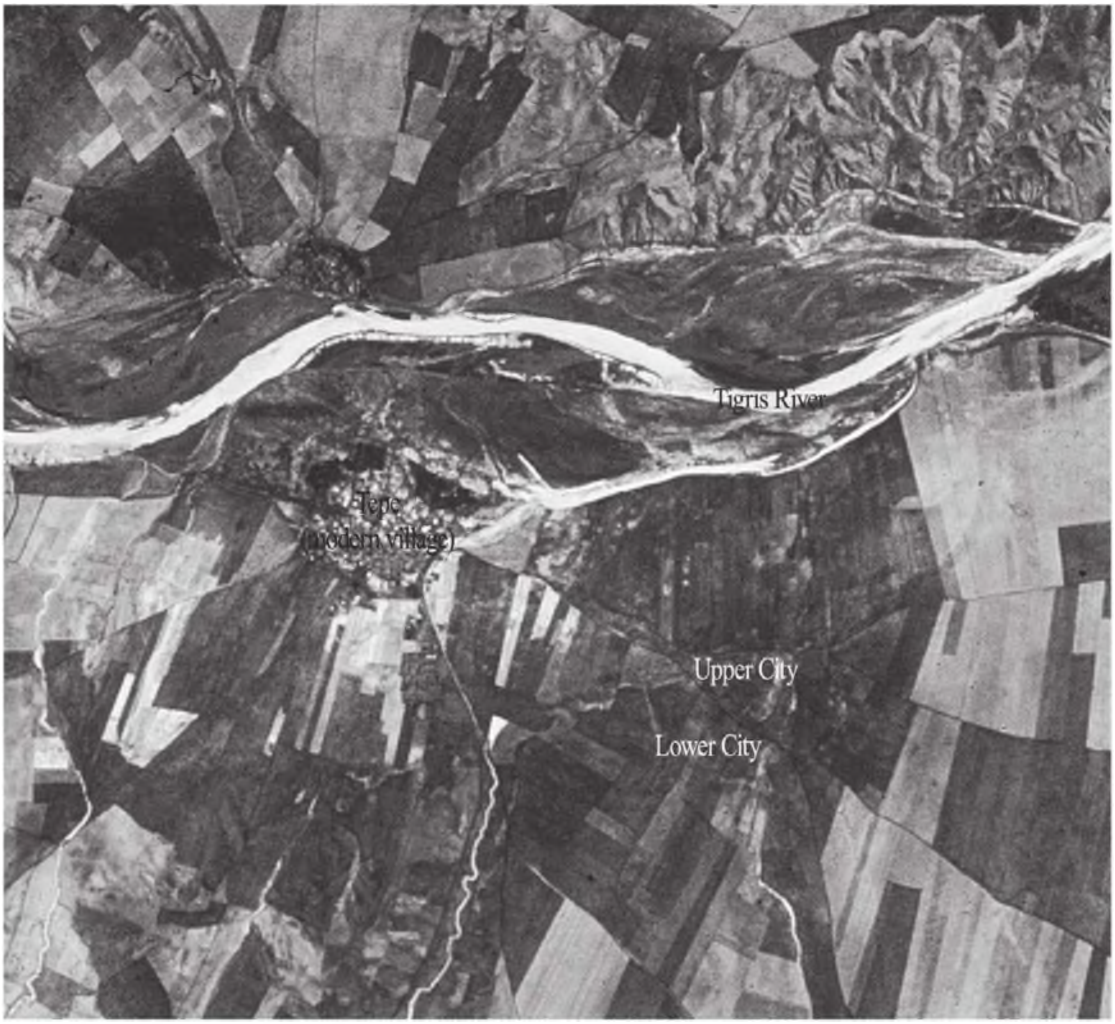


Fig. 4. Satellite view of Ziyaret Tepe (including its upper and lower cities). Courtesy of Google Maps.

dation pit, [and] built [and] completed it in a splendid fashion a new wall from top to bottom. A palace for my royal residence I founded inside" (Grayson 1991: 242–43, A.0.101.17 ii 6–28). We found evidence of the palace and an associated foundation deposit on top of the high mound in Operation A/N. After the rising and falling strength of the Middle Assyrians (in the 2nd millennium B.C.E.), Assurnasirpal's attempt to reoccupy Tushhan had only a relatively brief effect, lasting less than two hundred years, between the 9th and 7th centuries B.C.E. His efforts at recolonization of the upper reaches of the Assyrian Empire were reversed when the Babylonians and Medes invaded the Assyrian homeland (to the south) 612 B.C.E. A cuneiform tablet found at Ziyaret Tepe sheds light on this period of upheaval. The tablet was written by an Assyrian soldier, Mannu-ki-Labbali, who was posted at Tushhan and unaware that the capital city of Nineveh had already fallen. In his efforts to assemble a chariot unit, he complains that no one is left to fulfill this mission. At the end of his fearful letter, he predicts that "this will end in death" (Parpola 2008). Although we have not yet found battle-wounded bodies or mass graves from this period, the discovery of a piece of armor and the sudden hiatus in new building points to a cataclysmic event for the Assyrians.

At Ziyaret Tepe, I analyzed both architectural and artifactual data to observe several categories of domestic production and consumption, from the smallest unit of space (activity areas associated with different tasks) to rooms, houses, and, finally, neighborhoods. All these analyses revolve around household activities, because the house serves as the physical stage for a majority of individual actions. For each unit of analysis, I tried to consider the groups that created the resultant material culture. It is these social actors, the faces behind the households, not abstract entities such as adaptive mechanisms, who are the human agents producing and manipulating artifacts within households (Hendon 1996; Joyce and Gillespie 2000; Tringham 1991). This detailed study of domestic spaces and neighborhood organization at Ziyaret Tepe will help us better understand the social and economic variability of households within Assyrian cities. A better understanding of domestic production, craft specialization, and daily activities will allow us to create more accurate models to explain domestic economy and social organization in Mesopotamian cities.

Architectural Data from Ziyaret

As with many urban sites, the excavation goals at Ziyaret Tepe called for a broad program of study to investigate the spatial organization and functioning of a Late Assyrian city. In order to collect comparable data from a large horizontal area, we had to limit the exposure within any single area. The advantage of this approach was a diachronically and spatially diverse sample of buildings. The disadvantage, from a household perspective, is the lack of multiple houses from contemporary levels. Instead, excavations revealed a palace-like structure from Late Assyrian levels (Operation A/N), a series of medieval structures, including stone walls that may have served as the foundations for tents (Operation L), a Temple to Ishtar and several associated, elite houses (Operation G), and a city wall with an informal domestic area (Operation K). Tablets referring to Ishtar suggest that she may have been the city deity, in accord with a multi-millennial Mesopotamian tradition of selecting a divine urban protector.

Magnetic gradiometry and electrical resistivity techniques hint at dozens of additional urban features. These elements include streets of variable widths, kilns (visible because of the magnetic properties of fired clay), and the ghostly outlines of as-yet-unexcavated buildings. Of particular interest for household analysis is the presence of two gates that provide access to the lower town (Matney and Donkin 2006: 15, 24). If one were to follow the faint traces of the roads that led through these gates, the structures that lined these streets could be systematically sampled as one progressed further into the walled city. This might provide a window into heterogeneous residences, defensive features, shops, and religious shrines and temples.

In addition to the structures themselves, the features within the buildings communicate differences in wealth, social status, and possibly ethnicity. For example, we have uncovered a series of Late Assyrian rooms with baked-clay pipe drains and tiled floors. We have interpreted these rooms as "bathrooms," possibly associated with

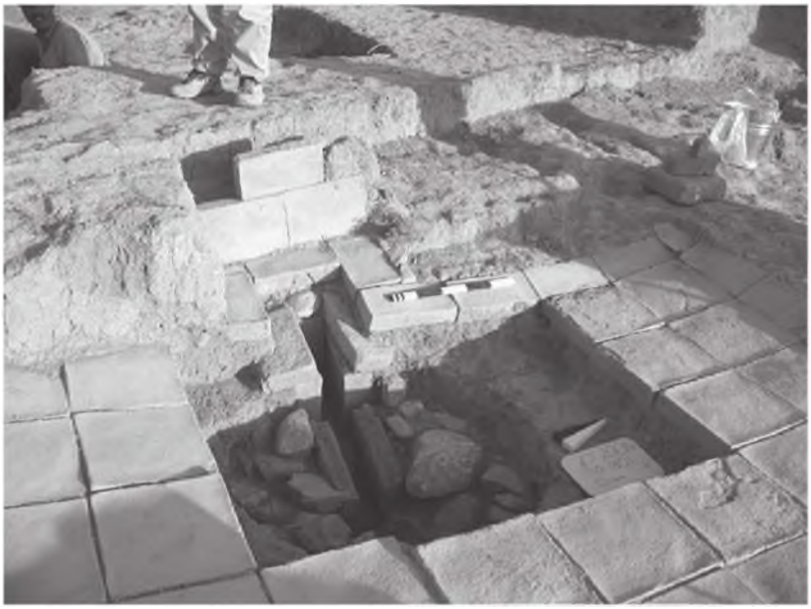


Fig. 5. Bathroom Feature in Operation G, Building 1, Feature G-801. The baked tiles have been removed from a portion of the floor to reveal a sub-layer of rocks that helped with the drainage. Courtesy of the Ziyaret Tepe Archaeological Project.

ritual ablutions. By far, the best constructed one was found in Room 15 within Building 1 in Operation G (the structure associated with Ishtar; fig. 5; see also Matney et al. 2009: 59). By contrast, in a contemporary, Late Assyrian level (L4) on the high mound in Operation L, a similar drainage feature was uncovered, but in this case the step-stones were broken and irregular (fig. 6; Matney et al. 2009: 53–54). Finally, a water feature found in Operation K, an area adjacent to the city wall with a series of irregularly constructed rooms, contained the poorest quality facility of all. Ringed by unmodified boulders and lacking the baked paving stones of Operations G and L, this is the low end of water drainage at Ziyaret Tepe (Matney and Rainville 2005: 34). Other common household features varied by socioeconomic class, including floor surfaces, tannurs, and burials. This variability is not surprising in an urban city but would have been invisible had we not sampled a diversity of households at the site.

A Study of Activity Areas at Ziyaret Tepe Using Micro-Archaeological Methods

To uncover evidence for ancient activity areas at Ziyaret Tepe, I collected micro-archaeology samples from a wide variety of deposits. More than 1,370 samples (ranging from 1 to 10 liters) were collected between 2002 and 2007 from dozens of structures (both public and domestic) and hundreds of individual rooms, dating from the 3rd millennium B.C.E. to the 16th century C.E. They were obtained from floor surfaces (both the fill and the actual trampled floor surface), courtyard areas (both within structures and in outdoor, publicly accessible spaces), streets (cobbled and mud-packed), and more specific loci of activities, such as hearths, ovens, craft production areas, storage pits, and middens. Samples were taken from features to provide a basis of comparison with micro-artifact densities from specific activity areas. Care was taken to collect samples away from disturbances such as rodent holes

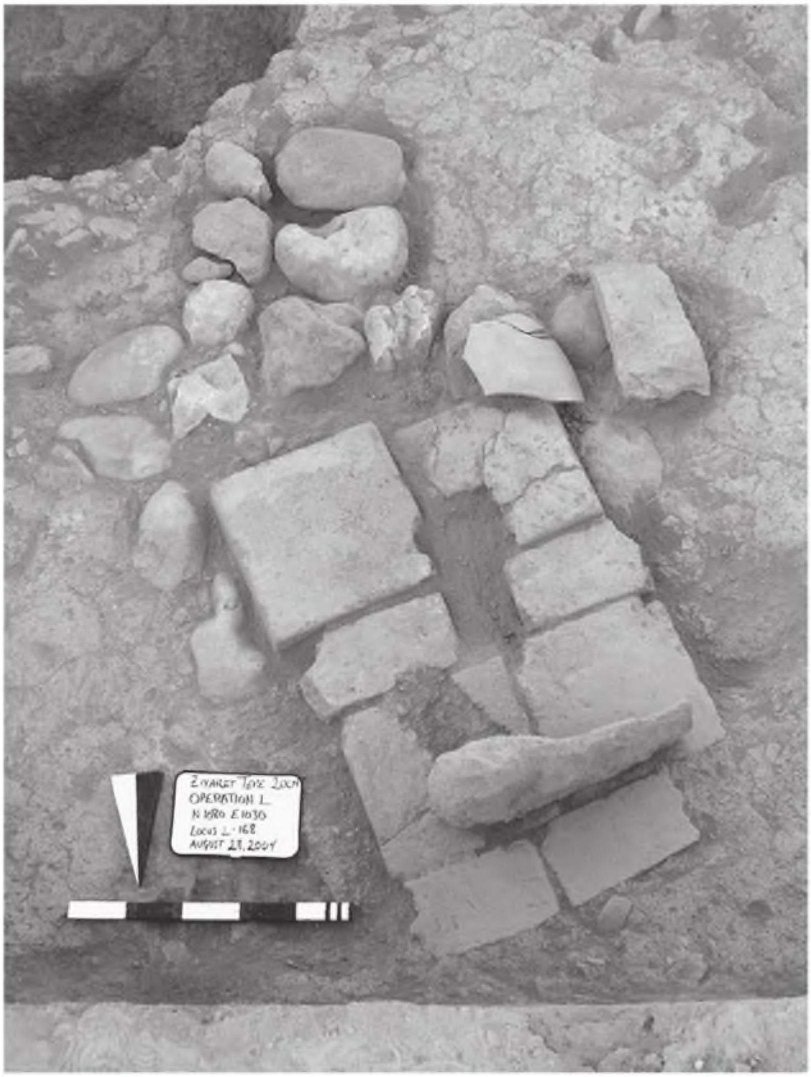


Fig. 6. Bathroom Feature in Operation L, Feature L-168. Here the baked tiles have not yet been removed. In comparison with fig. 5, these tiles are irregular and partially cracked. Courtesy of the Ziyaret Tepe Archaeological Project.

or churned sediments. For comparison, control samples were collected from non-cultural levels and from construction debris (Rainville 2003).

The samples were taken from a variety of areas and loci, allowing me to compare and contrast different socioeconomic areas of the site, from the monumental building excavated in Operation A/N (n=27) to a series of 3rd-millennium occupations, several Middle Assyrian domestic structures in Operation E (n=72), and a large Late Assyrian building with an intricate, pebbled mosaic excavated in Operation G (n=877). These trenches were located in one of two places: on the high mound (Operation A, E, and L, where n=289) or in the Lower Town (Operation G and K, where n=72). Many of the samples taken from Operation G came from well-excavated floors that were divided into equal-sized blocks and sampled explicitly for micro-debris analysis. This is an ideal way to collect micro-debris samples—when the horizontal dimension is well defined and understood. In addition to domestic floors, the samples were taken from a variety of locus types, including trash pits, supra-floors, hearths, tannurs, vessels, and outdoor surfaces.

I have discussed the correlations between micro-artifacts and locus types at Ziyaret Tepe elsewhere by calculating the mean density of micro-debris per locus (Rainville 2003: 55, table 1). In brief, there are several important analytical issues: are the micro-artifacts simply broken pieces of larger objects that have since been removed? How did the daily sweeping patterns affect the distribution of micro-artifacts? Assuming that repeated actions produce regular artifact distributions, can we characterize micro-debris "signatures" per locus type? Hierarchical clustering (using Ward's Method and micro-ceramics, bone, and lithic densities as variables) supports the conclusion that certain locus types share similar signatures based on the density of micro-ceramics, bones, and lithics (Rainville 2005: 49–68). There is more work to be done on testing the correlations among micro-artifacts, features, regularly collected artifacts, and geochemical techniques.

Spatially discrete samples illustrate the distribution of activity areas within households. For example, I collected 89 micro-debris samples from two rooms in Operation G (in Building 1, associated with the goddess Ishtar). The density of micro-artifacts varied throughout the room. The lithic debitage was concentrated in a corner, while the broken sherds were distributed throughout the room. One interpretation of this patterning is an area for flint-knapping versus the occasional dropped or chipped vessel (Rainville 2003: 196). When the micro-artifacts were sorted qualitatively, one half of a long, narrow room contained cooking wares and white debitage, while the other half lacked cooking wares and only contained tan debitage. The variable lithic debitage may correlate with an individual's preference for a certain tool or a certain type of knapping or food processing that occurred in a spatially discrete area.

Micro-Debris Results at Ziyaret Tepe

One important finding from these 1,370 samples is that multiple activities took place within any given room. Moreover, these activities were occasionally invisible at the macro-level. Instead, micro-artifacts were the only remaining trace of many daily activities such as stone tool retouching, food-processing, and *in situ* vessels (removed upon abandonment but often chipped or broken through everyday use or by reshaping broken sherds into new objects). Urbanites own belongings and they have a choice on how to "furnish" their homes. In most cases, people attempt to reestablish links to ancestral homelands by replicating their former environs. At Tushhan we would expect to find a difference between the homes of the non-local Assyrians and the local inhabitants. Moreover, decorating practices produce a sense of place (Pred 1990: 16–22). Thus, a closer study of household variability may provide a window into ethnic, socioeconomic, or religious diversity within ancient cities.

Second, the process of taking sediment samples provided an unexpected benefit beyond the analysis of micro-artifacts. Because the sediment samples were routinely taken from features and randomly sampled from interior and exterior surfaces, the micro-artifact densities calculated for each sample provided a baseline for quantifying artifact variability and, in turn, locating ancient activity areas and determining the amount of postdepositional disturbances. In an ideal field project, the volume of all excavated sediments per feature/surface would be calculated. But at large urban sites, it is very difficult to estimate the density of artifacts per feature accurately. The densities per sediment sample provided an unbiased, albeit limited, window into artifact densities from a large variety of activity areas. Moreover, each micro-debris sample was plotted onto the daily site plans, providing a spatial dimension for studying artifact distributions.

A third advantage of collecting micro-archaeological samples is the recovery of several categories of artifacts that are often overlooked with traditional troweling methods: fish and bird bones, pieces of metal, small clay tokens, pieces of glass, and beads. In most cases, these objects were not visible until after the flotation process. Remarkably, while the flotation process removes clays and other large sediments, it does not harm small and fragile artifacts. The latter can be picked out from the heavy fraction. The impact of micro-archaeology on refining our artifact typologies is discussed below in a separate section.

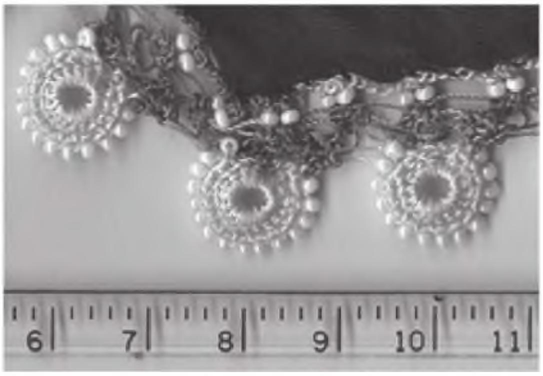
A fourth result derived from analysis of the samples was the beginning of an effort to apply experimental archaeology to understand breakage patterns in micro-artifacts. Ever since Schiffer's (1987) seminal work on postdepositional forces, archaeologists have been aware of the importance of understanding how artifacts entered the archaeological record. At Ziyaret, I collected modern shells (from the Tigris River) that corresponded to species found in archaeological contexts. I then experimented with the force that was necessary to produce the breakage patterns seen in ancient micro-debris samples. In short, it is quite difficult to break the shells unless they fall on a very hard surface (such as concrete) from a distance of more than a meter. Moreover, one has to exert an additional downward force to break the shells.

This suggests that the shells in the samples were not broken simply by treading over surfaces (especially in bare feet) nor were they likely to break from being dropped (especially on a mud-brick surface). Rather, I suggest that the shells may have been used as scrapers or, in the case of the clam shells, broken open for food. The next logical experiment would be to test ceramic breakage (from the discard pile of sherds) and animal bone breakage. Understanding artifact breakage, for both large and small pieces, will enable us better to interpret patterning in archaeological samples and, ideally, distinguish between natural and cultural disturbances.

Micro-Artifact Typologies

As with "macro-artifacts," micro-artifacts can be sorted in types. In some cases, just the presence of a typological category is significant. For example, in the medieval layers in Operation L, I found seven small pieces of glass fragments from beakers and cups, including green, clear, and amber-colored shards. One piece (ZT 21514) was blue-green in color, and although very fragmentary, it can be identified as part of a vessel 4 cm in diameter that dates to the 12th through 14th centuries C.E. The second piece of glass (ZT 21513) was also blue-green, dating to the 5th or 6th century C.E., most likely from a beaker or vase (Vorderstrasse, personal communication). These micro-shards were recovered from a tannur sample (L-205) located in trench N1090 E1030. This artifact type, a complete glass vessel, is rarely preserved at the macro-level. With more samples, we hope to be able to reconstruct medieval vessel forms that are otherwise not visible in the archaeological record.

Similarly, micro-archaeology is ideally suited to a more comprehensive study of beads. Most Near Eastern beads have been recovered from burials or caches and are often associated with magical or ritual properties (H. Beck 1931, 1976). While



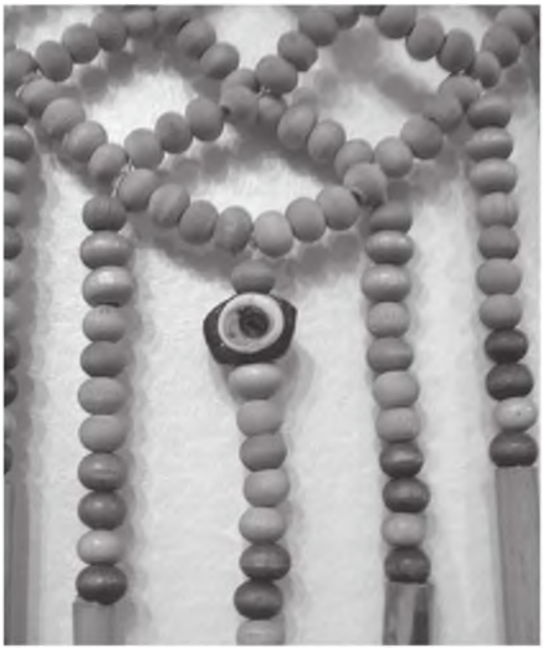


Fig. 7. (a, left) Contemporary head scarf with more than 1,000-plastic beads, seen in circles around the crocheted pattern and connecting the adornments to the center of the scarf. (b, right) Contemporary (yet traditional) wall-hanging which includes circular and cylindrical beads as well as an "evil eye" for protection. Photographer: Lynn Rainville.

of great interest in reconstructing funerary rituals and high-status objects, a lacuna in our understanding of the everyday secular use of beads is left. In modern-day Diyarbakır, beads are used in a wide-variety of situations: as jewelry (bracelets are most popular), in folk hanging (believed to ward off envy and bad luck) and prayer beads, on women's scarves and clothing, as decoration for doorways and horse bridles, and in countless other ways (fig. 7a, b). This does not mean that beads were used in identical contexts in Assyrian cities. From the 1,370 micro-debris samples at Ziyaret, I have recovered more than 250 beads of which only a handful are from burials (fig. 8). Instead, they were regularly recovered from micro-samples scraped from house floors and even tannurs and hearths where, presumably, they fell off clothing or wall-hangings.

Micro-archaeology also provides us with evidence of small animals, rarely represented in macro-samples. Animal bones found in micro-debris samples range from small pieces of large animals (such as cow's teeth) to the complete bones of small animals (such as rodent femurs). The majority of these bones can only be sorted into general size and taxa categories based on morphology, size, and texture of the bone. The size categories differentiate among large mammals (e.g., horse or cattle), medium mammals (e.g., sheep/goat, dog, or pig), small-to-medium mammals (e.g., rabbits), and small mammals (e.g., mouse or vole). In each category, young animal bones could fall into various categories (e.g., the bones of a ewe versus a full-grown sheep). In addition to mammals, bones were recovered from birds, reptiles, fish, gastropods, and bivalve shells. Of the approximately 100,000 micro-bones collected to date, only a small portion has been sorted to the species level. One sub-sample illustrates the benefits of collecting this material. In 2004, Adam Allentuck analyzed 672 faunal specimens from 81 micro-debris samples. An initial sorting was conducted under a fluorescent light, but those that appeared to be identifiable were examined

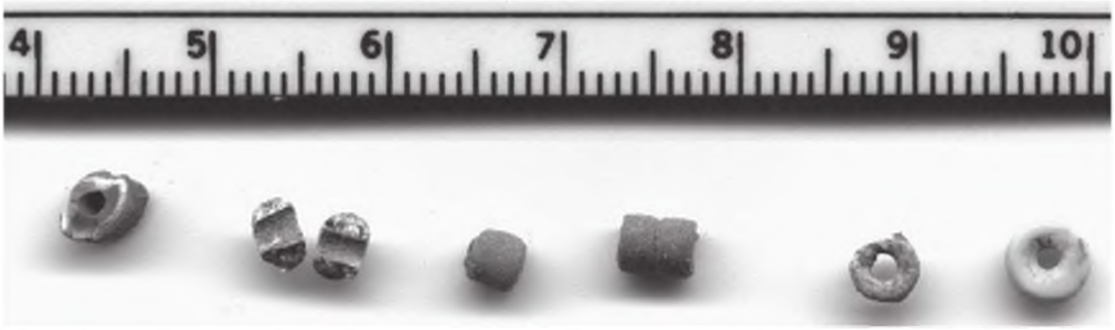


Fig. 8. A selection of beads from Assyrian contexts. Some are not yet separated from their molds, others have been carved from natural materials. Scanned by Lynn Rainville.

under a low power binocular light microscope that could magnify to a maxium of 40×. In addition to the size class, the specimens were identified on the basis of osteological element and the lowest possible taxonomic level. The portion (i.e., proximal, shaft, distal, etc.) of the element was recorded. The Number of Identified Specimens (NISP) was recorded to identify the number of specimens per taxon.

The most prevalent species were from the order *Rodentia*, totaling 288 specimens (n=672). Of these fragments, 55 were rodent incisors. The large number of identifiable rodent remains does not necessarily mean that this was the most abundant animal found in these features. Rather, parts of the skeletal anatomy of a rodent, such as the teeth, are more readily identifiable than fragmentary pieces of other animals. The next most frequent species identified was the class *Osteichthyes* (bony fish), with 55 identifiable bones. This is in sharp contrast to macro-faunal collections at Ziyaret, which rarely contain fish bones. For example, a recent study of 954 bones collected from nonmicro-samples contained no fish bones (Greenfield 2009). In the micro-samples, the class *Aves* (bird) is represented by 19 specimens, but only one was identifiable by order and it was, most likely, a house sparrow. Finally, amphibians accounted for 45 specimens, 44 of which could be positively identified as frog (*Ranidae*). Only two reptile bones were identified: one as *Squamata* (snake) and the other as *Testudines* (turtle/tortoise). Amphibians and reptiles were also absent from the traditional faunal analysis because of the difficulties of recovering these small bones with traditional troweling techniques. The retrieval of a more complete set of animal species from micro-debris samples gives us a more accurate picture of diet, environment, and wild species.

Conclusion: Future Studies

In the future, I suggest several methodological modifications for the collection and analysis of micro-archaeological samples for all urban sites. First, a uniform collection and flotation system must be applied. While the quantity of sampled sediment does not have to be identical for each sample (because count and weight measurement can be expressed as densities), samples should be processed in a similar manner, by collecting a whole-earth sample (including any macro-artifacts that lie on or in the sediment), floating the sediment, counting and weighing all artifactual remains, both macro and micro. When this procedure is followed, each sample will reveal a ratio of macro- to micro-artifacts and serve as a window into artifact densities across the site. Moreover, where micro-artifacts occur in high densities in otherwise "clean" surfaces (with a low macro-artifact density), the sampling strategy can be modified. For example, a room with few macro-artifacts but dense micro-artifacts may merit additional sampling in the field.

In order for micro-archaeology to provide a more useful window into past activities, micro-debris samples should be taken from every excavated room, outdoor surface, and street. Features should also be regularly sampled so that different areas can be tested for "high" and "low" artifact densities. The study of micro-debris, although not singularly conclusive, adds significantly to our understanding of the distribution of activities within ancient structures. Understanding domestic activities in turn provides a foundation for household and urban archaeology. These goals will help us demonstrate how socioeconomic relations can be located in everyday domestic practices and activities as much as in large-scale political and economic transformations. Household archaeology should not stand alone as a "domestic inquiry." Rather, a more detailed study of domestic socioeconomic activities will broaden our understanding of everyday lives in Assyrian cities.

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Shifting Household Economics of Plant Use from the Early to Late Natufian Periods of the Southern Levant

Arlene M. Rosen

Researchers have used household archaeology to enhance our knowledge of social and kin structures, activity areas in domestic residences, division of labor and space along lines of gender, and to increase our understanding of micro-economic activities within a wide range of archaeological contexts. In the Near East, this potent approach to social and economic archaeology is primarily applied to archaeological sites in village and town settings (Rainville 2000; Rosen 1989; Sherwood 2001). However, household archaeology also has great potential for understanding the organization of family and economic life within ancient hunter-gatherer communities. Household archaeology provides a useful conceptual framework for examining the micro-economic decision-making of individual forager groups. This approach can be especially useful for contextualizing the changes in Natufian Period plant exploitation strategies in a time of significant climate and environmental changes that would have significantly altered the resources available to these foraging groups. A close examination of households among the Natufian foraging societies in the Southern Levantine Mediterranean area can potentially contribute much to our knowledge of micro-economic activities, division of labor, and the role of family units in plant and animal exploitation. It may also be possible to understand how these social factors changed through time from the Early Natufian Period (14500–13000 cal. B.P.) corresponding to the warmer and moister Bølling/Allerød climatic episode, through the Late Natufian Period (13000–11600 cal. B.P.) when foragers were compelled to adapt their economies to the cooler and drier climate of the Younger Dryas.

Studies of prehistoric hunter-gatherer households in the Near East are rare (Hardy-Smith and Edwards 2004), partially because a key element of this kind of research is the identification of a "residential unit" (Haviland et al. 2010). Yet these kin groupings are often difficult to define in prehistoric contexts. In order to identify possible households, archaeologists first must establish the presence of residences. This is dependent upon locating archaeological remains of structures and/or hearth features that we assume form the spatial focus of family life and home-based economic activities. This is far more evident when investigating village and town sites than hunter-gatherer sites, which are often ephemeral camps with few architectural

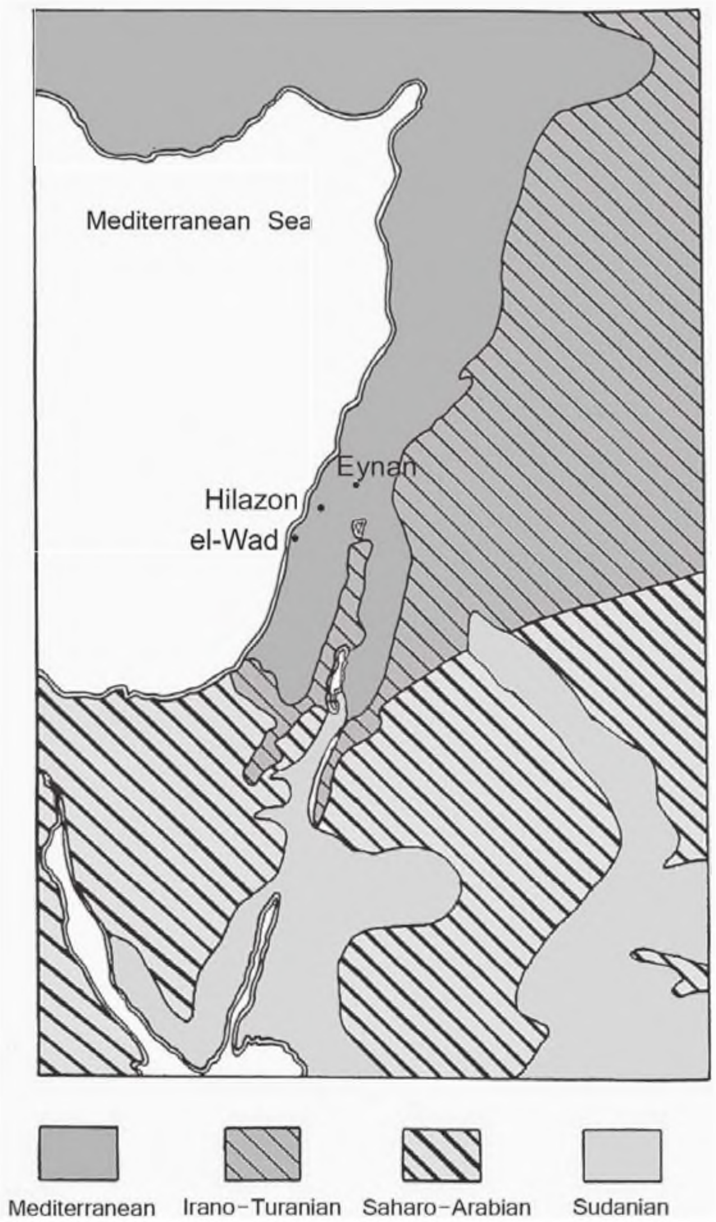

Fig. 1. Map of sites discussed in the text.

remains. Even when the site is a base camp with long-term seasonal or even more sedentary occupation, the structures housing family units are often constructed of matting, brush superstructures, and reed fencing to define space. These are highly perishable materials that leave few traces in the archaeological record.

Phytolith analysis is one very effective method for identifying the remains of perishable structures constructed from the shoots of reeds, rushes, and palms, as well as woody plants that would normally only leave macro-botanical remains if they had burned. Therefore, phytoliths can aid archaeologists in defining household residences at hunter-gather sites. Phytoliths can also provide evidence of the use of space within a residential unit, since many economic and craft activities in hunter-gatherer communities are plant-based.

Phytoliths are the silica bodies that form within the epidermal cells of grasses, sedges, and reeds, among other types of plants, and create microfossil casts of the cells of these tissues. They are identified to various taxonomic levels, depending upon the cell types (Piperno 2006; Rosen 1999). Hunter-gatherer dwellings and shelters composed of perishable plants, such as brush and reeds, would not remain in the archaeological record unless charred, and only the woody plants such as tree branches and shrubs might survive the burning and leave remains in the form of charcoal. Remains of structures made of reeds and sedges used for matting and wall construction would not survive burning due to the fragile nature of the stems. However, both reeds and sedge stems are active phytolith producers, and the phytolith evidence for these features would remain in the archaeological record indefinitely. The same would be true for the evidence of other activities involving reeds and sedges. For example, phytoliths from these plants could be used to identify sedge matting defining sleeping areas or *Phragmites* reeds for caning or fuel. Phytoliths from food remains, such as the seed-husks of grasses and cereals, are often abundant in archaeological sites and do not require charring as do macro-botanical remains.

In this essay, I will examine the phytolith evidence for household microeconomic decision-making at the Early–Late Natufian site of Eynan (Ain Mallaha), located at the edge of the Hula wetlands in northern Israel. At Eynan, changes in the distribution of plants associated with different households characterize the way space was appropriated for food consumption, processing, and storage, as well as defining indoor and outdoor activities. It also addresses the issue of resource selection strategies at the family and household level at one extensively excavated site. I then compare these data with phytolith evidence from the Early Natufian levels at the site of el-Wad in the Carmel Hills and Late Natufian levels at Hilazon Tachtit rock shelter in the Galilee, all located within the Mediterranean climatic and vegetation zone of northern Israel (fig. 1). The aim is to understand how the significant environmental changes that occurred between these two Natufian periods might have affected household economies, food sharing, and storage practices within these Natufian phases in order to shed light on social and economic shifts from the Early to Late Natufian Periods.

An Outline of Terminal Pleistocene Climate Change

A number of authors have noted that the climatic shifts from the Late Pleistocene to the Early Holocene (ca. 15,000–11,700 cal. B.P.) correspond in time with shifts in subsistence patterns and material culture between the Early and Late/Final Natufian Periods (Bar-Yosef 1996; Bar-Yosef and Belfer-Cohen 2002; Goring-Morris and Belfer-Cohen 1998; Henry 1989, 1991; McCorriston and Hole 1991; Moore and Hillman 1992). This has led to the proposal that climatic changes were a major stimulus to cultural transformations and were responsible for stimulating the Natufians to take the first steps toward the cultivation of wild cereals. This would ultimately culminate in the first farming villages of the Pre-Pottery Neolithic in the Early Holocene (Bar-Yosef 1996; Bar-Yosef and Belfer-Cohen 2002; Goring-Morris and Belfer-Cohen 1998; Henry 1989; McCorriston and Hole 1991; Moore and Hillman 1992). Elsewhere, I have argued that climatic shifts did require changes in Natufian adaptive strategies, but rather than setting the Natufians on a course of cultivation leading to agriculture,

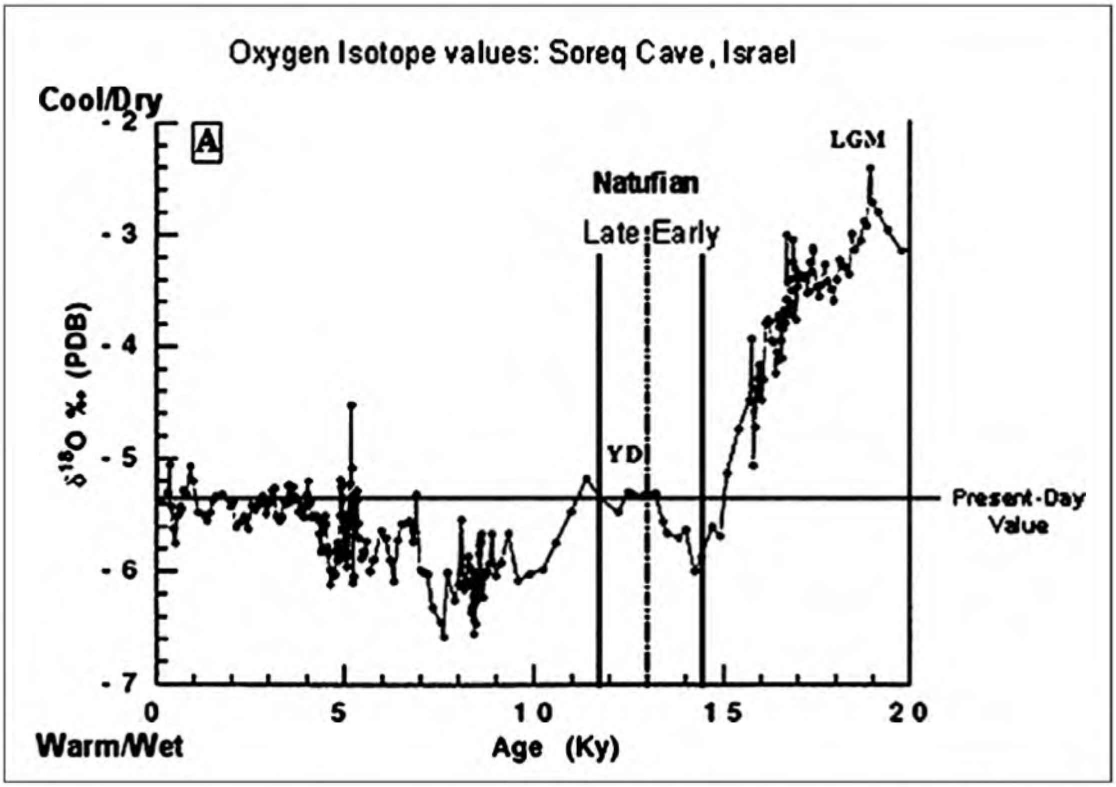

Fig. 2. Oxygen isotope curve from speleothems at Nahal Soreq Cave, from Bar-Matthews et al. 1999, reprinted from Rosen 2007a.

they led to new ranking of plant subsistence resources. This in turn allowed the Late and Final Natufians to return to a more stable subsistence system based on foraging (Rosen 2007a, 2011; Rosen and Rivera-Collazo 2012). These Late Pleistocene climatic changes are important to review here, because they would have had a major impact on Natufian households from the perspective of scheduling of tasks, division of labor, targeting of new resources, and the management of those resources.

Evidence from the oxygen isotope record taken from speleothems at Nahal Soreq Cave (fig. 2) indicates that the Late Glacial Maximum (ca. 23,000 cal. B.P.) was a cool and dry episode (Bar-Matthews et al. 1999) that affected vegetation communities. The extent of the Mediterranean oak and pistachio forest was reduced in favor of more xeric plant associations, including chenopods, *Artemisia*, and to a certain extent grasses (fig. 3; Baruch and Bottema 1999). We know from ice cores, tree rings and other proxies that global temperatures began to warm in what is known in the European Late Pleistocene climatic sequence as the Bølling/Allerød Period around 15,000 cal. B.P. (Friedrich et al. 2001). This warming phase is recorded in the Soreq oxygen isotope sequences as a rapid warming and increased precipitation wetting up, which (according to the traditional dating of the Hula pollen diagram) led to the swift expansion of forests in the Southern Levant (Baruch and Bottema 1999). Many of these newly established forest plants were nut-bearing trees such as oak (*Quercus* sp.), pistachio (*Pistacia* sp.), and almond (*Amygdalus communis*). Fruit trees such as

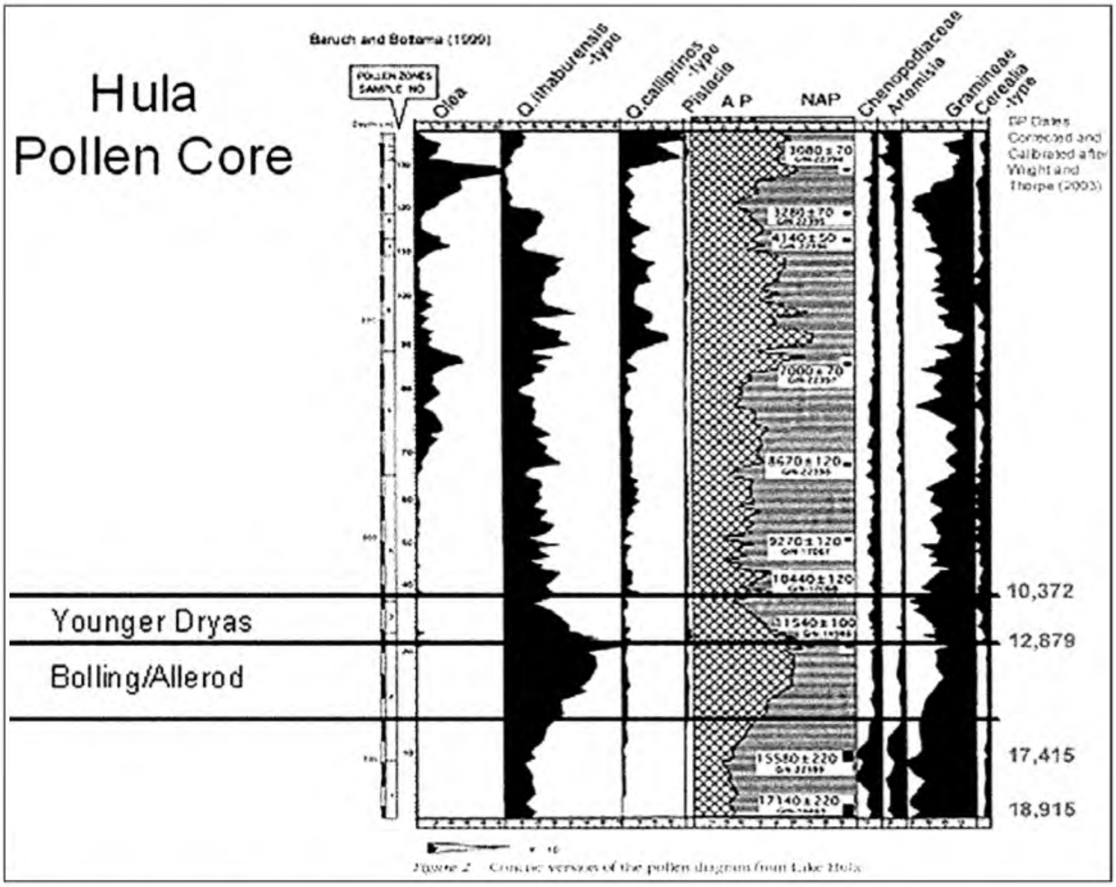

Fig. 3. Lake Hula pollen diagram from Baruch and Bottema (1999), reprinted from Rosen 2007a.

olive (*Olea* sp.)m and edible legumes, such as carob (*Ceratonia siliqua*), were also common. These forests were rich in high-protein plant resources and were therefore an attractive target for foraging communities such as the Early Natufians who first appeared in the region shortly after the beginning of the Bølling/Allerød phase (Bar-Yosef 1998, 2002; Goring-Morris 1998; Valla 1998).

The Bølling/Allerød amelioration ended abruptly around 13,000 cal. B.P. with the beginning of the Younger Dryas episode. The Younger Dryas is characterized throughout the Northern Hemisphere as a relatively brief (from 1,000 to 1,500 years) return to the cool/dry climate of the Last Glacial Maximum (LGM). It ended abruptly ca. 11,700 cal. B.P. with the beginning of the Holocene (Alley 2000). This climatic shift also occurs in the climatic proxy records of the Southern Levant. The Soreq Cave isotope record shows a shift back to a cooler/drier climate, although it doesn't approach the extent of climatic deterioration that characterized the LGM. The Dead Sea sediment record shows that the former Pleistocene Lake Lisan was drastically reduced at this time and transformed into what we know today as a much smaller and shallower Dead Sea Lake (Bartov et al. 2002; Yechieli et al. 1993). The Hula pollen core shows a decrease in the Mediterranean oak forest, with an increase in more steppic plants including a notable increase in grasses (Baruch and Bottema 1999). Significantly, the Younger Dryas episode corresponds very closely with the shift from the Early Natufian to the Late Natufian Periods.

Background to the Early and Late Natufian Periods

The Early Natufians are first recognized as a cultural entity around 15,000 cal. B.P. Their origins are still unknown, although some researchers suggest that they may have arisen out of the desert hunter-gatherer communities to the east of the Mediterranean environmental zone (Goring-Morris 1998). Natufian culture was first noted and described by Dorothy Garrod from her excavations in the Carmel Caves and the site of Shuqba in the Wadi an-Natuf. The "classic" Natufian cultural complex is traditionally associated with the heart of the Mediterranean environmental zone. It is characterized by semipermanent to permanent village sites consisting of round and semicircular structures with stone foundations and brush or reed superstructures. Early Natufian sites are noted for having burials in which grave goods and ornaments made of shell, stone, and bone appear for the first time in the Levant. Early Natufian domestic structures had indoor and outdoor hearths, numerous grinding stones, deep bedrock mortars or "cupholes," and often contained sickle blades and numerous microlithic flint artifacts (Bar-Yosef 1998, 2002; Valla 1998). In the semiarid areas to the south, north, and east, there are variations in traits, although sites such as Dederiyeh Cave appear to have all of the characteristics of the "classic" Natufian, even as far north as northern Syria (Y. Nishiaki, personal communication).

In the Late Natufian (ca. 13,000–11,600 B.P.), the number of sites in the region increased but their size decreased and there is a sense of greater mobility. In spite of this, grinding stones found in these sites became more plentiful in the Mediterranean zone (Wright 1994). In the peripheral zones on the desert margins, there seems to have been a shift to more-efficient hunting technologies with the appearance of a new lithic tool type, the Harifian point, later in this period. Burials at Natufian sites in the Mediterranean area lacked the grave goods of the earlier periods.

The Site of Eynan

The Natufian site of Eynan (Ain Mallaha) is located at the margins of the Hula wetlands near the Hula Lake. It is situated next to the Eynan spring, with the hills of the Galilee rising behind the site to the west. This has always been a very resource-rich locality, within proximity to the wetland plants, birds, and other animals from the Hula Marsh, fish from the lake, and upland resources rich in Mediterranean tree crops as well as grasses and wild cereals. Eynan was occupied throughout the Early to Final Natufian Periods, as defined by it latest excavator Francois Valla, from ca. 14,200–11,600 cal. B.P. (Valla et al. 2007). Occupation at the site was fully sedentary throughout these periods, including during the generally more mobile phase of the Late Natufian Period. The site consists of a number of semisubterranean hut-like dwellings cut into the hill-slope and defined by a semicircular outline of stones, suggesting that houses were formed by a half-circle of wall and ramada-like roofing, with the other half of the circular living space unwalled and unroofed. The houses contained hearths in what appear to be both inside and outside locations, a few possible storage features in the form of pits that were partially coated with plaster, and numerous burials in association with the dwellings (Bar-Yosef 1998; Valla et al. 2004).

Eynan is in an ideal site for allowing us to investigate changes in hunter-gatherer household economies and economic decision-making at the household level. The longevity of the site means that it remained in existence throughout the period of profound changes in climate and environment that occurred throughout its occupation. This should theoretically provide a significant depth of time with which to examine economic changes. Since the site is located within a transitional ecotone between several converging plant communities, we can observe variations in resource selection from a varied resource base.

The resource selection strategies should be visible within the floral and faunal records at the site. Although there is good preservation of faunal remains that provide a representative picture of hunting strategies, Eynan, like most other Natufian sites, yielded very little in the way of charcoal remains, thus making it difficult for earlier researchers to comment on the plant foraging activities of the site's inhabitants. Thus, there was frustratingly little information to support or negate the hypothesis put forward by many researchers that Natufian intensification of wild-cereal collection led to eventual cultivation (Bar-Yosef and Belfer-Cohen 1992; Henry 1989; McCorriston and Hole 1991; Wright and Thorpe 2003).

The only way we can approach the question of plant-resource selection on the part of the Natufians is to examine plant use on a household level. The decisions about which resources to target, exploit, and intensify in times of climatic change were made within the family group. But in order to understand how these household economies might have changed, we need more data on plant use on a site-by-site, house-by-house basis. Since phytoliths are typically abundant at Natufian sites, they have the potential to answer these questions about plant use that would be impossible to answer from the macrobotanical evidence alone.

Background to Phytoliths Analyses

Phytoliths are composed of opaline silica that is highly resistant to decay and leave an enduring record in the sediment of most archaeological sites in the Near East (Rosen 1999). They form within the cells of grass and sedge epidermal tissue and take on the shape of these cells, thus creating microfossils and allowing us to identify them at varying taxonomic levels, depending on the cell that is silicified. For the most part, when individual cells are silicified they can be identified to the part of the plant from which they are derived and often can be assigned to a grass subfamily such as panicoid, pooid, and chloridoid grasses. These grass subfamilies are loosely related to environmental and growing conditions. Panicoid grasses are often associated with warm, moist conditions such as wetland environments in semiarid localities. Pooid grasses are generally associated with temperate climates and include wheat, barley, and their associated weed grasses. The chloridoid subfamily usually grows under semiarid and dry conditions. However, in situations in which there is a large amount of silica and moisture in the soil of the growing environment, a number of adjacent cells will silicify. These multi-celled phytoliths provide an opportunity to observe and describe a variety of characteristics that together allow taxonomic identifications to the genus level.

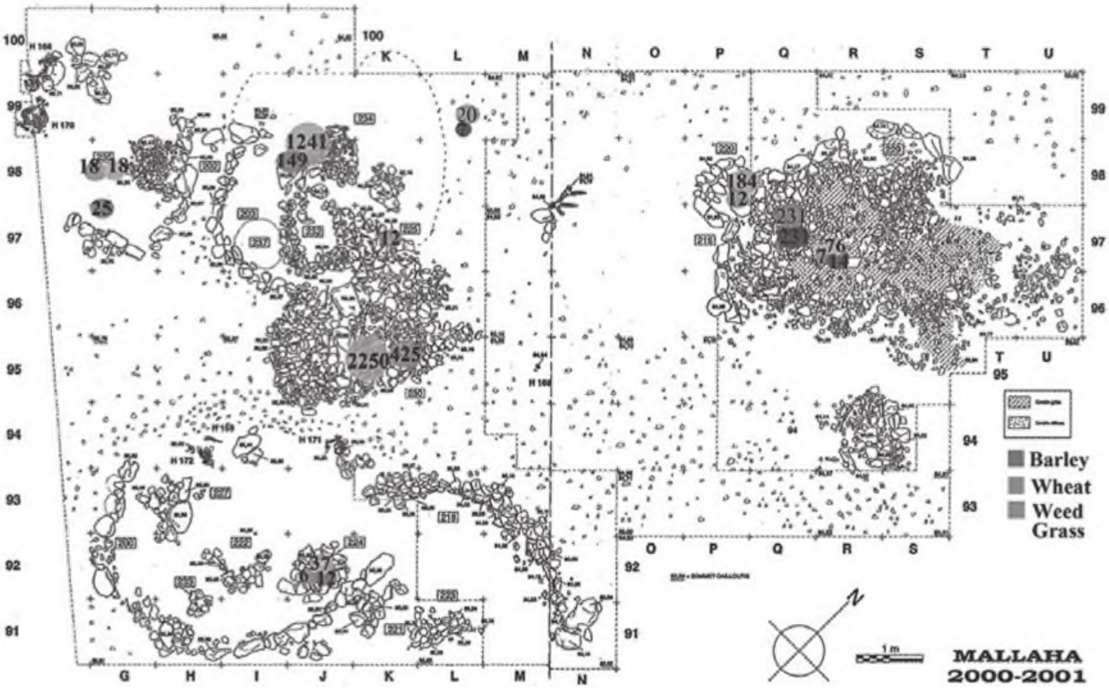

Fig. 4. Map of the Late/Final Natufian structures at Eynan after Valla et al. 2004.

Phytoliths are extracted from the sediment in the laboratory by first removing calcium carbonates with a 10% solution of HCl. Then the clays are removed by settling the silt and sand fractions and pouring off the clays. After drying the remaining material, it is burned at 500 degrees C to remove organic matter. The sediment is then floated in a heavy density liquid (Sodium polytungstate) calibrated at 2.3 sp gravity. The phytoliths are removed from the suspension, washed, and mounted on microscope slides in a fixed mount using Entellan. Phytolith counts usually include about 300 to 400 single-cell and 50 to 100 multi-cell individuals. These counts are absolute numbers calculated to the number of phytoliths per gram of sediment.

Phytolith Results from Eynan

Phytolith samples were collected from a number of different archaeological contexts at Eynan. This has provided an indication of the range of variability of taxa as well as relative concentrations of phytolith types at different locations at the site. Most samples come from Late/Final Natufian contexts, but four of the samples were collected from the Early Natufian village levels that provide a tentative contrast to those from the later period. The detailed phytolith results by sample and context have been previously reported (Rosen 2004, 2007b). Here, I will summarize the characteristics relevant for understanding Natufian plant-use at a household level and how that might have changed in the shift from Early to Late Natufian.

Phytolith remains from the structure represented by Locus 215 and 228 were among the densest at the site (fig. 4). The most notable results for these loci are the abundance of *Phragmites* sp. (common reed) phytoliths from both the cane and

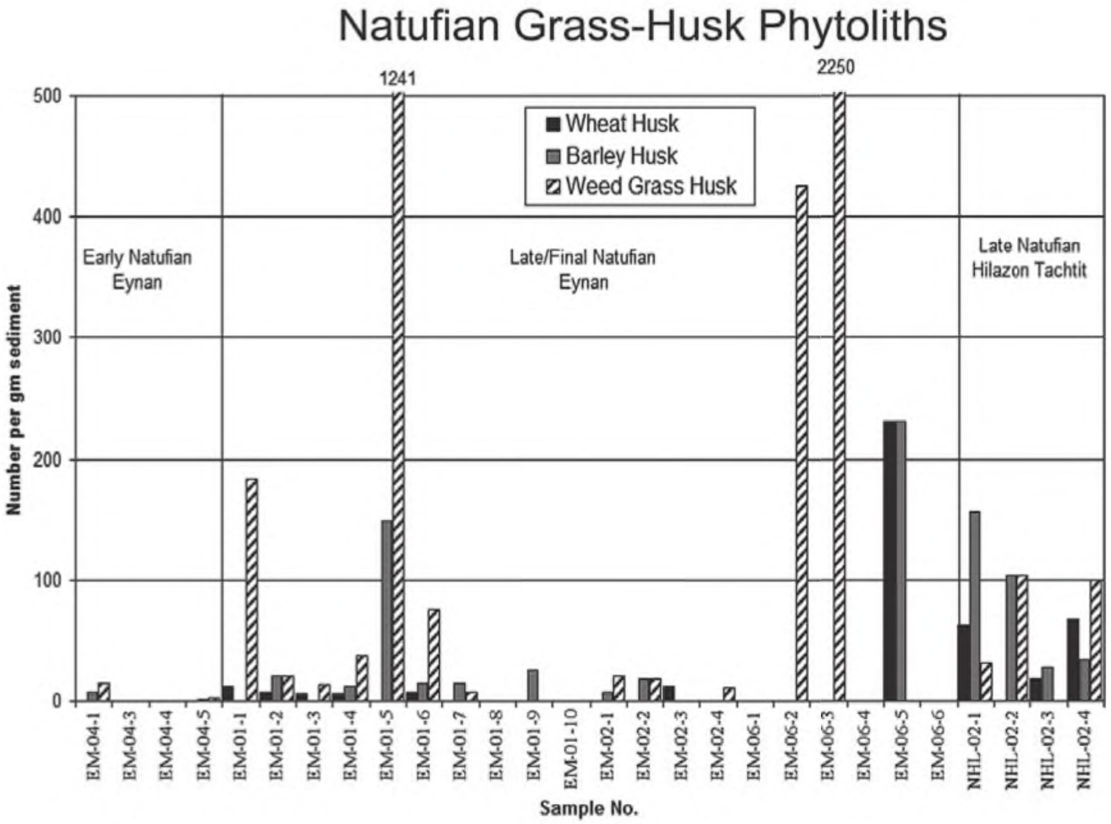

Fig. 5. Graph showing quantities (number of phytoliths per gram sediment) and types of grass-husk phytoliths from Eynan (Early and Late/Final Natufian levels). The grass husk phytoliths are a proxy for grass seeds and grains.

the leaves, primarily concentrated along the back wall of the structure. This can be interpreted as wall-construction material. There were also significant numbers of phytoliths from sedges (*Cyperaceae*) in this location. Sedges are commonly used for matting due to the soft spongy stems of the plant. It is likely that there were sedge mats laid down at the back of the structure protected by the semicircular wall, forming a private area of the house for sleeping and daytime activities. This area of the structure was also notable for the relatively large concentrations of grains from a mix of wheat and barley in Sample EM-06-5 and another mix of weed grasses and wheat in Sample EM-01-1. The latter contained far more seed-husks from noncereal grasses than from wheat. Together, these samples appear to have been localities in the back of the structure in which grass seeds might have been stored. The center of this structure yielded a mix of wheat, barley, and weed-grass husk phytoliths, an indication that a mix of wild cereal and noncereal grains was being processed and/or consumed in this location. There were also large numbers of starches in three of the samples from the center of this structure (EM-01-10, EM-01-6, and EM-01-7).

Other sampling locations consist of features described as hearths due to their configuration as a small circle of stones and ashy deposits within. Hearth 224 contains relatively equivalent concentrations of phytoliths from husks of wheat, barley,

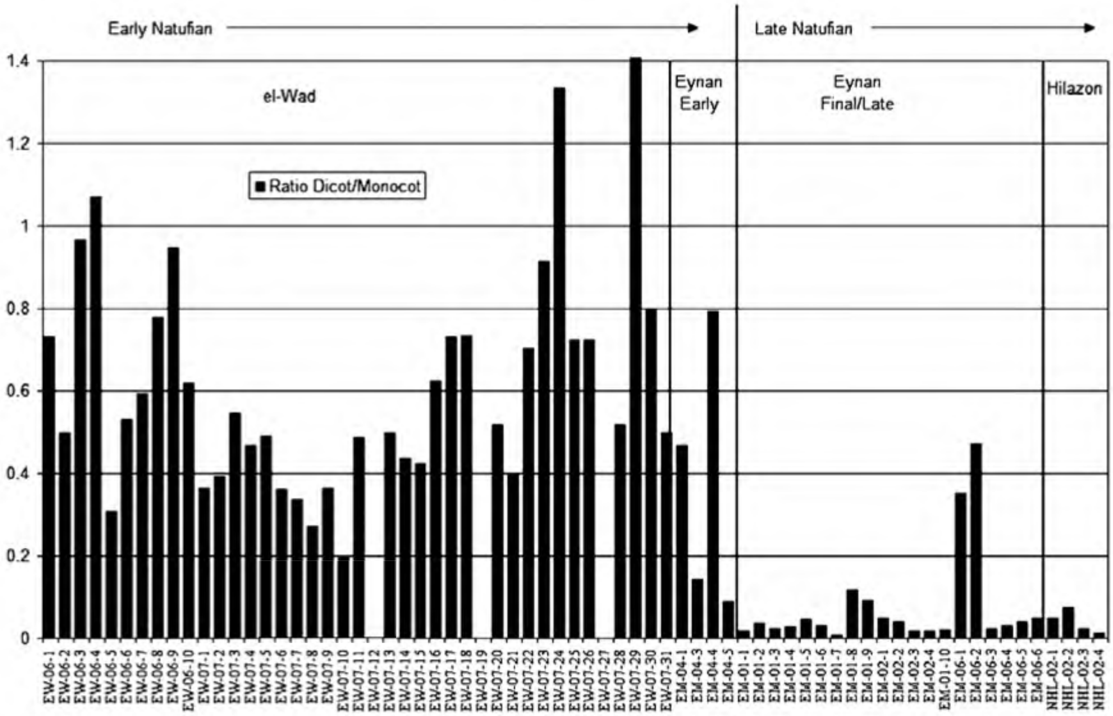

Fig. 6. Graph showing the ratio of phytoliths from trees and woody shrubs (dicotyledons) versus phytoliths from grasses and sedges (monocotyledons). The higher numbers relate to larger numbers of tree and woody shrub phytoliths.

and weed grasses, with a dominance of the weed-grass forms. This again implies that these grass seeds, whether cereals or other grasses, were all being cooked and consumed. I also found unidentified starches within these samples. The consumption of grass seeds of all types is even more apparent at Locus 230, where the weed-grass seeds are abundant and there is no wheat or barley. This area is also characterized by large numbers of sedge phytoliths, suggesting the possible presence of matting or baskets. Likewise, within the burned material of Structure 203, there are large concentrations of phytoliths from barley and wild-grass husks, as well as significant amounts of sedges.

The results from the Late/Final Natufian levels at Eynan compare favorably in amounts and types of grass grains with Late Natufian samples from the site of Hilazon Tachtit (fig. 5). However, they contrast with the results from the small number of samples analyzed from the Early Natufian levels at the site and a larger number of samples from Early Natufian strata at the site of el-Wad analyzed in collaboration with M. Portillo (Portillo et al. 2010). The available plant resources around el-Wad were similar to those at Eynan in the sense that at both sites, there would have been easy access to forest resources on the upper slopes and wetland resources in the Hula valley in the case of Eynan or the coastal plain marshes in the case of el-Wad.

One major contrast between the phytoliths of Early and Final Natufian strata at all three sites is the amount of dicotyledonous plants (trees and shrubs) that dominate the earlier levels versus the monocotyledons (grasses, reeds, and sedges) that are

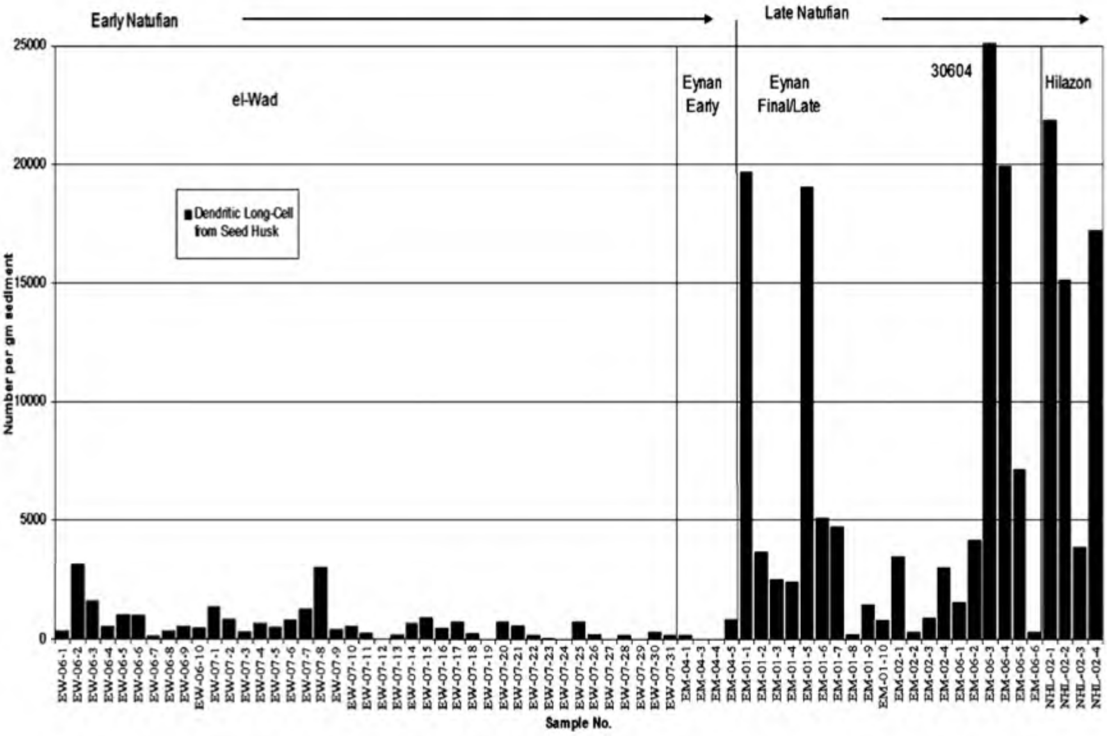

Fig. 7. Graph showing quantities (number of phytoliths per gram sediment) of *dendritic* phytoliths from seed husks.

prominent in the Late and Final Natufian levels (fig. 6). At el-Wad, the ratio of dicot to monocot phytoliths shows that much more plant material from trees and shrubs is being brought into the cave than from grasses and sedges. This could be both for fuel use and edible resources. Another notable trend is the increase in dendritic phytolith forms in the Late and Final Natufian periods (fig. 7). The dendritics are a form of long-cell that is exclusively found in the husk of grasses and can be used as a proxy for the consumption of grains at an archaeological site. The samples from el-Wad as well as the Early Natufian from Eynan have significantly fewer dendritic forms than the Late Natufian samples from Eynan and Hilazon Tachtit, suggesting there was a pronounced increase in the exploitation of grains in later periods.

The type of grains being exploited by the Natufians is indicated by the multi-cell phytoliths that can often be identified to genus and sometime species (fig. 5). In this case there are examples of phytoliths from wheat (*Triticum* sp.), barley (*Hordeum* sp.), and other non-cereal grasses termed "weed-grasses." The results of these analyses show that grass seeds are not very common in the Early Natufian levels of Eynan and el-Wad but much more abundant in the Late Natufian of both Eynan and Hilazon Tachtit. Surprisingly, though, wheat and barley are not the dominant grasses being exploited by the inhabitants of Eynan and Hilazon Tachtit, and in some contexts weed-grass husks are far more abundant than cereals. This suggests that even small-seeded grasses were actively collected, processed, and consumed by the Late Natufians in this region.

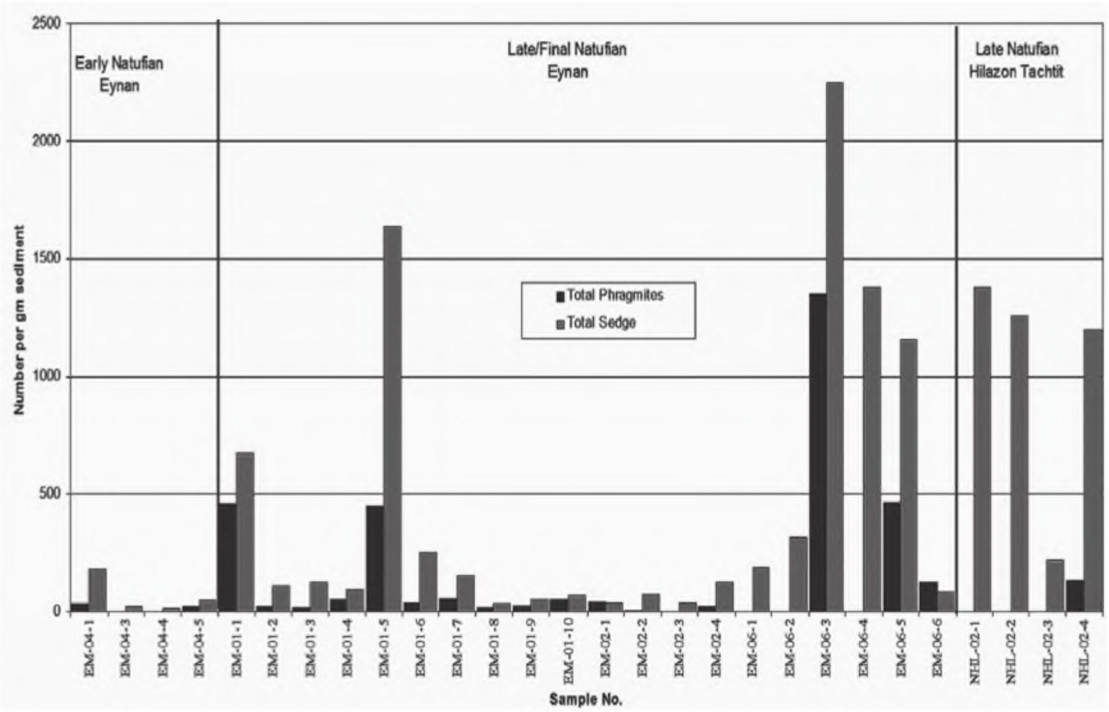

Fig. 8. Graph showing quantities (number of phytoliths per gram sediment) of phytoliths from common reed (*Phragmites* sp.) and sedges (Cyperaceae).

Finally, fig. 8 shows the amount of common reed (*Phragmites* sp.) and sedge (Cyperaceae) phytoliths from Early to Final Natufian samples at Eynan and Late Natufian samples at Hilazon Tachtit. Although conclusions based on these data must be considered tentative due to the limited number of samples, the data suggest a trend toward increased use of reeds and sedges in later periods, probably for construction of roofing, walls, fuel, matting, and basketry materials. These data also provide insight into changing plant exploitation strategies between Early and Late Natufian levels that may correspond to changes in the environmental and social landscapes in the final phases of the Late Pleistocene.

Discussion

The phytolith evidence from the Early Natufian (represented by the sites of el-Wad and four samples from lower levels at Eynan) shows a dominance of phytoliths from woody shrubs and trees (dicotyledons). There is a noticeable shift in the Late/Final Natufian (at Eynan and Hilzon Tachtit) to the primary use of monocotyledons, including grasses, reeds, and sedges with a marked decrease in the amounts of woody plants. This cannot be explained by local geographic differences, since all three sites would have been located in areas with a mosaic of available forest and wetland resources. The reasons for this shift probably relate to two main factors. One is the impact of climatic change on the distribution and seasonality of available plant-food resources. The other is the change in distribution and size of Natufian communities from the Early to Late Natufian. Both of these factors could have had a significant impact on shifting household economies from the Early to Late periods. As discussed previously, the forest expansion in the Bølling/Allerød moist episode created opportunities for the Early Natufian occupants of the region to exploit forest products, including acorns, nuts, and arboreal legumes as high-ranked primary resources, with small and large-seeded grasses as a secondary resource choice (Barlow and Heck 2002).

With the shift from warm and moist conditions in the Bølling/Allerød to the cooler, drier climate of the Younger Dryas episode, the nut-bearing trees and shrubs retreated in favor of expanded grasslands and open parkland environments (Bottema 2002). Though nuts and acorns still would have been available, the size and distribution of patches would have been significantly reduced along with the distribution of these patches. In order to continue to exploit these key resources in their new localities, Natufian communities would have had to increase their mobility. During the Younger Dryas, mobility does appear to increase among populations in the southern semiarid regions of the Levant (as indicated by sites in the Negev Desert and Jordan), but sites in the Mediterranean zones generally became smaller, and more territoriality is indicated rather than more mobility (Bar-Yosef 2002; Bar-Yosef and Belfer-Cohen 2002; Goring-Morris 1998; Goring-Morris and Belfer-Cohen 1998; Henry 1991).

This restructuring of the network of settlements is likely paralleled by a concomitant restructuring of social networks, as communities competed for more-restricted resources. Since productivity of individual nut groves varies from year to year, the increasing territoriality would further compound and intensify competition for forest resources by restricting the ability of Late Natufian households to move throughout the territory freely to exploit the patches that were most productive in any given year. Likewise, they would be unable to send family members out in gathering parties for extended periods of time to acquire resources from long distances. This lack of mobility would restrict a household to "their" patch, which may or may not be productive in a given year, thereby reducing predictability and increasing risk. The combination of a reduction of resources and decreased mobility would induce households to change their resource ranking (Winterhalder and Goland 1997).

Grass seeds are often cited by human behavioral ecologists as a classic example of a second-ranked resource that can provide high yields and a high caloric value, although the costs of collection and processing are significantly greater than those for nuts. Therefore, changes in the availability of primary resources will ultimately lead to a shift in resource-ranking, encouraging the development of new technologies to raise the second-ranked resource to the level of primary(Winterhalder and Goland 1997). In this case, it would be a shift from nuts and arboreal legumes to grass-seeds. Furthermore, given the data from Eynan, this may not have been restricted to wild cereals but would have included small-seeded wild grasses or wild weed grasses as well. Although grinding stones can be used for a variety of purposes, the increase in numbers of grinding stones from the Early to Late/Final Natufian supports the hypothesis that Natufian communities invested in alternative technologies during the Late and Final Natufian Periods (Wright 1994).

Another factor here would have been the advantage of sustainability. Grasses are annuals and return each year in the same location. Therefore, if the grass and sedge resources are managed properly, the abundance can be maintained. Thus there would be no need to seek out the most productive patches from year to year. This would increase predictability and reduce risk. According to human behavioral ecological theory, the exploitation of grasses leads to greater diet breadth resulting in greater overall food energy that can be invested in children among other things (Barlow and Heck 2002). In addition to grass-seed exploitation, the phytolith evidence indicates that there was an increase in the use of reeds and sedges for household needs such as fuel, building materials, basketry, and matting. In a sense, it demonstrates a localized "Monocot Revolution" representing a more intensive use of local grass and sedge resources and a shift away from the need for mobile task groups to be sent out collecting resources from long distances. This scenario implies that even a large sedentary site such as Eynan could maintain its size and sedentary nature in the face of shrinking forest resources and reduced territory by virtue of living next to the Hula wetlands, with its abundant grass and sedges.

Some of the effects of this Monocot Revolution on Natufian households would have been the increased value of children in household provisioning, since resource collection could consistently be conducted closer to home. There also might have been an increase in the number of craft activities related to basketry and matting. Long-term decision-making and planning at the household level could also have been affected by changes in storability of resources. Nuts are harvested in the autumn, which is the beginning of the rainy season in the southern Levant. This might make them less conducive to storage, due to the moisture in the atmosphere inducing mildew and rotting. In contrast, grass seeds are collected in the spring, at the beginning of the dry season, allowing desiccation of the seeds. This might have provided a better chance for long-term storage (Rosen 2011). All of the above factors would have influenced the economic decision-making of Natufian households at Eynan and other sites. These decisions would have affected the structuring of day-to-day activities among family groups and the intra-household relationships between males and females, adults and children, among other divisions.

Conclusions

In this essay, I have demonstrated the importance of obtaining a good record of Natufian plant resource collection strategies in the period coinciding with the shift from the Bølling/Allerød to the Younger Dryas in the Near East. Phytolith analyses are one of the few consistent sources of this kind of information that is available from all Natufian sites in the Levant. At the outset of this essay, I suggested that phytolith studies at Natufian sites could provide new insights on micro-economic decision-making relating to resource selection at the household level. This has been supported by the phytolith results from the sites of Eynan in the Hula Valley, el-Wad in the Carmel coastal mountain range, and Hilazon Tachtit from the Galilee. These data indicate that there were profound changes in the types of plants exploited from the Early through the Final Natufian. Preliminary results from these sites suggest an emphasis on forest-based resources in the Early Natufian that would have corresponded to the moister climatic phase of the Bølling/Allerød. The phytolith record also marks a shift to more intensive exploitation of grasses, reeds, and sedges in the Late/Final Natufian, leading to what could be considered a Monocot Revolution that was contemporary with the drier Younger Dryas phase. New food resource ranking strategies led to heavy exploitation of grass seeds, including much use of small-seeded weed-grasses as well as wild cereals. The exploitation of reeds and sedges for construction, fuel, and matting also increased dramatically in the Late/Final Natufian Period.

These shifts would have had a great effect on household economies from the Early to Late/Final Natufian Periods. At this point, we can only speculate on what this effect might have been; however, it is possible that households were affected in the following ways. Since most monocotyledons are annuals, the reliance on grasses and sedges would have greatly increased the sustainability of high-ranked resources in proximity to households, especially in the case of Eynan, which was located at the edge of the Hula marsh. Sustainability would mean that a household could continually exploit these resources from a sedentary base. This might have changed the structure of family life by reducing the number of task groups that were required to go out to undertake long-distance collecting. It would also insure that children could be included in more tasks if these were conducted closer to the home.

The increased investment in new and existing technologies for grinding grass seeds, basketry, and matting arts, as well as using new materials for house construction would have altered the structure and scheduling of daily household tasks. Finally, the amenability of grass seeds for long-term storage would have a profound impact on household provisioning and long-term planning by adding a more effective risk-reduction element to subsistence strategies. It would also affect factors related to ownership, sharing, and wealth accumulation, possibly requiring the redefinition of kin relationships.

Apart from the micro-economic impact of a monocot revolution on the Natufian household, this change in resource exploitation strategy from an emphasis on forest-based products toward a more sustainable system of exploiting grasses and sedges guaranteed that the Natufian way of life could continue along a stable course throughout the ca. 1300-year duration of the Younger Dryas, ending only with the beginning of the Holocene.

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Defining Households:

Micro-Contextual Analysis of Early Neolithic Households in the Zagros, Iran

Wendy Matthews

Defining Households

This essay examines households as one aspect of community, and interior and exterior spaces as loci of household and community interrelationships. In particular, it analyzes, at high-resolution, surfaces in interior and exterior areas as material media that create and define social settings and boundaries and as embodiments of the histories of people and place, which are detectable in the archaeological record. The case-study examines the nature of early Neolithic sedentary communities and households in the Zagros, Iran, ca. 10,000–6,000 cal. B.C. This region is of central importance to studies of the transition from mobile hunter-gatherer to sedentary communities and the development of early households, as it is here that there is evidence of early settlement and architecture and domestication of goat, by ca. 8,000 cal B.C.

The definition and identification of both house and household are problematic. There is still considerable need for further development in anthropological and archaeological studies of households as key economic, political, social, and cultural groups in many communities and houses as material representations and embodiments of them (Carsten and Hugh-Jones 1995). It is perhaps unproductive to try to define households without consideration of particular contexts and histories, as in the study of communities more generally (Cohen 2002). Households are composed of individuals that may or may not be genetically related and are only one aspect of human interrelationships and communities. One issue is that households are not static social, economic, or political groups (Moore 1986). The composition, structure, and relationships within and between households may change at seasonal, annual, life-cycle, and other timescales. In addition, individuals and households are often associated with more than one building or place. It is precisely the nature and management of these temporal changes and associations with different places during their life-histories, however, that are fundamental to our understanding of households and communities and how they articulate and engage with each other (Brück and Goodman 1999).

Investigations of households should consider not only other spatial and relational scales, including individuals and communities, but also multiple temporalities (Lucas 2005). Bowser and Patton (2004), in an ethnoarchaeological study of houses in Ecuadorian Amazon, have examined ways in which social relationships and the practice of politics may be embedded in household interactions at a range of timescales and in different contexts: through exchanges and negotiations in everyday life in visits to other houses and en route to these; during feasts or other rituals periodically; throughout the year in houses and public spaces; and during the lifecourse. They observe that "houses are built, renewed and abandoned in keeping with the temporality of building materials, the household developmental-cycle and the concomitant maturation and punctuating shifts in people's alliances" (Bowser and Patton 2004: 178). In the longer term, houses and their places may be a testimony to land rights, ancestral relationships and contested histories.

Many archaeological timescales, however, are based on interpretation of the constructs of building phases and levels and are "longer-term and less finely tuned than the timescales of the social processes which created the data in the first place" (Foxhall 2000: 496). In many archaeological sites, few artifacts are left *in situ* within buildings or settlements to indicate where and how households structured their activities. Those that do remain often relate to isolated events or to clutter refuse (Metcalfe and Heath 1990) and activities at the time of abandonment or postabandonment (Cameron and Tomka 1993; Hodder 1999). When analyzing the architecture at the Neolithic settlement of Jarmo in the Zagros, L. Braidwood et al. (1983: 10) argue that, as at many sites, "we have no really good evidence that might specify the use to which the various rooms in a given house were put," as few artifacts were left on floors.

One aim of this essay is to investigate how microscopic analysis of microstratigraphic sequences within buildings and settlements can contribute to the study of household and community practices and boundaries by examination of traces of surfaces and activities at high-resolution timescales that are closer to individual lifehistories and the temporal rhythms and practices that structure them (Boivin 2000; W. Matthews and Ergenekon 1998, W. Matthews 2005a, 2005b). The other aim is to examine whether the house is of central importance in constructing and maintaining social relationships and continuity through the embedding of ritual and daily practice in the construction, use, abandonment, and reuse of houses in the Neolithic of the Zagros, as at Çatalhöyük and other sites in the Near East (Hodder 2006: 37; Kuijt, 2000, 2008; Kuijt and Goring-Morris 2002; W. Matthews 2005a, 2005b). Voigt (1983: 311) proposes that the household was the primary unit of production and consumption in the Zagros by the late Neolithic, at sites such as Hajji Firuz Tepe ca. 6300 cal B.C., which is contemporary with Çatalhöyük in central Turkey. She argues that at Hajji Firuz Tepe "households or minimum residential units were economically homogeneous," with "no evidence for specialization or for significant differences in wealth between households" (Voigt 1983: 311).

In addressing these methodological and substantive questions, this essay considers evidence from previous excavations of Neolithic sites in the Zagros and from micromorphological analyses of buildings and exterior areas at two Aceramic Neolithic sites, Sheikh-e-Abad and Jani, from new excavations by the Central Zagros Archaeological Project (CZAP) co-directed by Prof. Roger Matthews (UCL), Dr. Yacob Mohamadifar and Dr. Abbas Motarjem (Bu Ali Sina University, Hamedan), and the author, in July and August 2008 (R. Matthews et al. 2010, in press). This essay begins with a review of methodologies in the study of households and an introduction to the approaches applied in this investigation. The methods reviewed include: analysis of architectural remains and features, artifacts, bioarchaeological and microarchaeological remains, microstratigraphy, and micromorphology; study of spatial boundaries, syntax, and networks; operational chains; and use of historical and ethnographic records and excavation reports.

This study examines evidence for sequential development in the Zagros of: first, early Neolithic sites with few traces of architecture; second, communities with aggregated clusters of rooms and shared facilities; and third, more clearly defined households. Like Prof. Henrietta Moore (personal communication), I argue for a multi-sited approach to the study of households that does not atomize buildings by focusing on them alone. There is considerable evidence for habituated practice and socialization in exterior as well as interior areas in the Zagros (Pollock et al. 2010). Elements of similar repetitive practices across a community may serve to socialize, integrate, and encompass its members, as well as conceal differences (Derrida 1986; Lévi-Strauss 1963). Each building and area, however, is also a unique situation, with the potential to inform on both short- and long-term practices and histories of individual households and communities (Tringham 1995; W. Matthews 2005a). This essay concludes with a brief consideration of household burials in the Zagros, as well as directions for future research.

Excavation Publications

Of the Neolithic sites in the north and central Zagros and adjacent plains (fig. 1), well-published excavations include those at Tepe Abdul Hosein (Pullar 1990), Ali Kosh (Hole et al. 1969), Chogha Bonut (Alizadeh 2003), Chogha Mish (Alizadeh 2008; Delougaz and Kantor 1996), Chogha Sefid (Hole 1977), Hajji Firuz (Voigt 1983), Jarmo (L. Braidwood et al.1983), Karim Shahir (L. Braidwood et al. 1983), Shanidar (R. S. Solecki et al. 2004), and Zawi Chemi Shanidar (R. L. Solecki 1981). Regrettably, some key sites for the Neolithic of the Zagros are not yet fully published, notably Tepe Asiab and Sarab (R. J. Braidwood 1961; R. J. Braidwood and Howe 1960) and, to a lesser extent, Ganj Dareh (Smith 1976, 1978, 1990) and Tepe Guran (Meldgaard et al. 1963). Specialist reports and unpublished Ph.D. theses on these sites, however, are available. New discoveries by survey and excavation at a wide range of Aceramic and Ceramic Neolithic sites across Iran are revolutionizing understanding of the nature and extent of Neolithic developments across this major region, from Tepe Sialk and sites in the Seymarreh and Fars regions in western Iran (Pollock et al. 2010; Potts and Roustaei 2006; Weeks et al. 2006, to Sange Chakmak and sites in the Bam region in eastern Iran (Garazhian 2009).

Archaeological projects and publications often focus on a particular range of research questions and objectives and may not record aspects that are not considered significant at the time (Hodder 1999). Particularly relevant to this study is the variation in the nature and level of recording of floor-packing, plasters, surfaces, accumulated residues and postdepositional alterations. Some of the most detailed records on surfaces and microstratigraphy are those by Voigt (1983) for Hajji Firuz Tepe. Ideally, final reports should include photographs and drawings of interior and exterior surfaces and deposits in section profiles as well as in plan. This would enable greater use of evidence from surfaces and stratigraphy in interpretations of activity areas

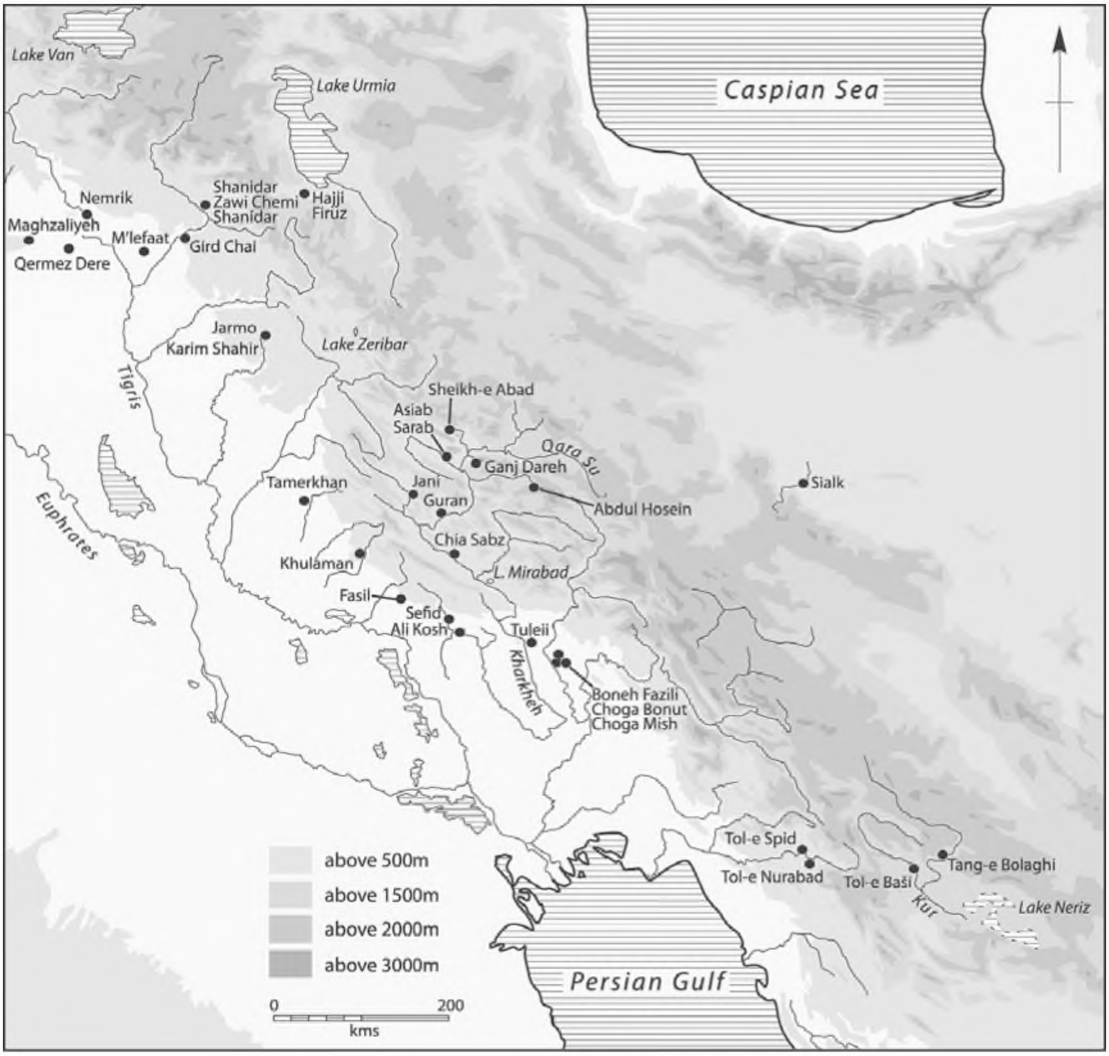


Fig. 1. Neolithic sites in the Zagros and adjacent regions.

and histories of buildings and settlements by the excavators as well as readers. Color images provide the most useful evidence and could be included in accompanying CDs or Web sites, although curation of these digital media needs to be considered.

Identification of Households and Their Life-Histories

Identification of clearly defined houses as architectural units that were used at least in part for residential purposes and/or domestic production and consumption is problematic for a range of reasons, many of which are discussed by Smith (1990). These difficulties include problems relating to:

- incomplete excavation of entire structures due to the limited size of archaeological trenches and to the depth of overlying deposits;
- the range of materials used within single walls and adjacent walls, which

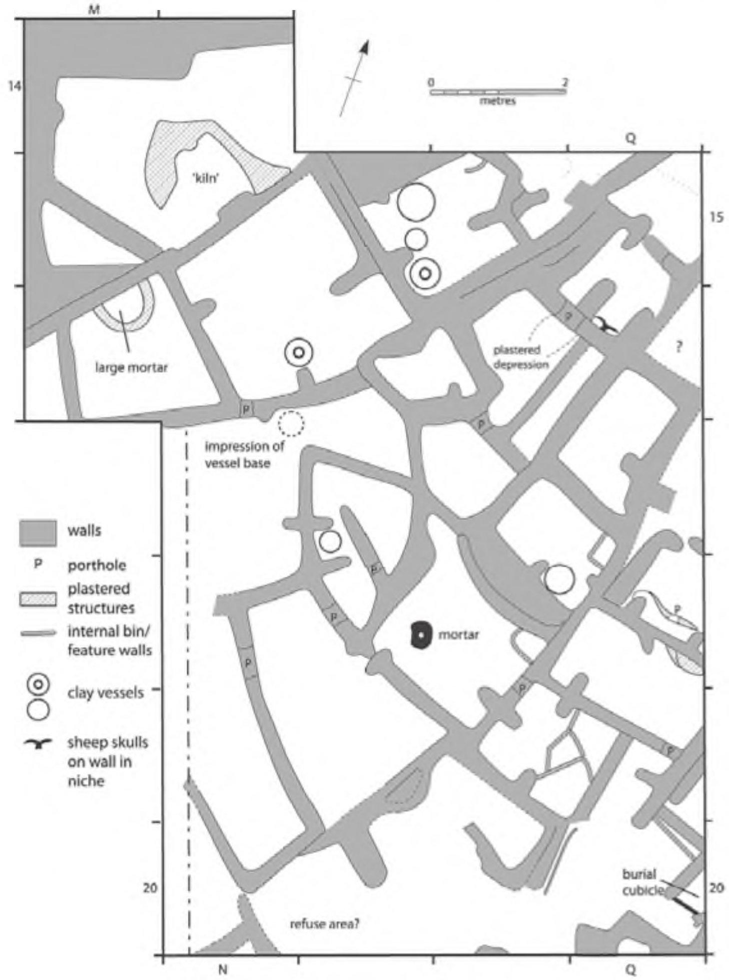


Fig. 2. Level D buildings at Ganj Dareh (after Smith 1990: fig. 1).

make it difficult to identify discrete structures or building episodes, particularly within aggregated clusters of rooms and buildings;

- identification of individual architectural units, particularly in the early levels of many sites, where architectural remains comprise dense aggregated clusters of rooms that share party walls, as at Ganj Dareh (fig. 2). Where features such as ovens, storage bins, and grindstone installations occur repeatedly across aggregated clusters of rooms, in some cases it may be possible to suggest the presence of individual units of food production and consumption and residence, based on principles of redundancy, as suggested by Byrd (2000) for the Neolithic of the Levant;
- recognition of whether or not there was an upper story and/or flat roof and whether some activities and features are thereby not represented by the ground floor/semisubterranean plans of buildings or are preserved in collapsed remains on floors (e.g., L. Braidwood et al. 1983; Smith 1990);
- the complex modifications to buildings during their life-history, which make establishment of the contemporaneity of features, rooms, and buildings complex, particularly for buildings and structures of mud brick/pisé, which can be readily modified (Smith 1990);

- analysis of the life-histories of many buildings and areas, which may change at daily, seasonal, annual, and other or longer timescales (Boivin 2000; W. Matthews 2005a). Ethnographic research in Iran and other regions has established that many buildings are subject to a devolutionary cycle in which rooms such as living rooms may be used for storage, then penning, and later refuse as the structure of the building becomes less sound (David and Kramer 2001; Horne 1994). Such cycles however, will both depend on and inform on a range of factors and historical contingencies, including demography, the life-history of individual households (Butzer 1982), and practices associated with the closure of old buildings and construction of new ones (W. Matthews 2005a);
- the leveling of walls at the end of the life of a building to heights often of 0.5 to 1.0 m, which may remove traces of raised thresholds, portholes, and windows, and thereby key information on spatial syntax and links between different rooms and areas of buildings;
- the susceptibility of some architectural materials to decay, particularly wood and reed members, walls, or roofs (R. J. Braidwood 1961).

In developing methodologies for study of households and communities associated with buildings, therefore, these potential problems need to be considered in-depth. As examples of such difficulties, identification of separate houses or social units at Jarmo and other sites, including Sheikh-e Abad Trench 3, Ganj Dareh D, and possibly Jarmo J-II,5 (L. Braidwood et al. 1983: fig. 95) was problematic: party walls were often shared, entrances were often from above, and there is evidence of collapsed upper stories at some sites. In addition, as at Ganj Dareh Level D and apparently at Sheikh-e Abad, potential key household features such as ovens were often not within buildings. In the light of these considerations, one way forward is to analyze spatial and temporal variation in surfaces and residues within each room and area to examine independent traces of the syntax and sequence of boundaries and activities.

Interpretation of Activities

The principal sources of excavated evidence for interpretation of many household and community activities and life-histories are: features, such as ovens and storage bins; artifacts; bioarchaeological remains; micro-archaeological residues; and, as this essay aims to illustrate, microstratigraphic sequences. Some of the problems and assumptions in interpretation of each of these categories of evidence are considered here.

Features such as hearths, ovens, storage bins, and grindstone emplacements are common at many Neolithic sites in the Zagros. Although fixed in place, their locations cannot be assumed to have been permanent. Smith (1990) records that features, walls, and portholes were frequently modified, but the evidence for this is not published. Voigt (1983: 297) suggests that the use of ovens and storage-bin features may have varied seasonally, as also observed at Çatalhöyük (W. Matthews 2005b). Many features may be cleaned out at the end of use, leaving few clues to their use, or subject to specific closure procedures, some of which may have been symbolic.

Interpretation of some features from Neolithic sites in the Zagros may be uncertain. L. Braidwood et al. (1983: 157, figs. 26–29) were unsure whether the "baked-in-place" oval features were hearths/ovens or clay-lined storage pits that had been burned to clean them out. The burned lining and ashy and charcoal lenses suggest that these features were hearths. Many pits may originally have been used for storage, but there is little conclusive evidence to support this, and they were often filled with refuse and fire-cracked stones at the end of their life (L. Braidwood et al. 1983: 158).

Interpretations of the distributions of artifacts need to consider the "use-life" or life-history of the artifact and whether its context relates to manufacture, storage, primary use, secondary use, or postdepositional alterations, including scavenging, collapse, and discard (Kent 1984; Schiffer 1987). It is likely that the artifacts and "mat" on a leveled oven and building debris in J-II,5 and possibly in J-I,6a at Jarmo do not represent an irregular constructed living floor (L. Braidwood et al. 1983: fig. 95) but relate to a late use phase of the building, perhaps as a discard area, and/or to materials collapsed from a flat roof and reed-lined ceiling.

In addition, it is important to consider the types of activities to which the artifact may have been related and the "operational chains" and sequences, networks of people and activities with which they are associated. Voigt (1983) classified all artifacts, including pottery, chipped stone, and groundstone according to the types of activities with which they may have been associated, based largely on form, although traces of use-wear were also apparent on some. Voigt (1983: 309–10) provides a list of the links between artifacts and types of activities as a transparent guide to the range of activities conducted at the site and to the interpretation of specific distributions of artifacts. The significance and associations of artifacts can also be evaluated by examination of their location in relation to architectural contexts and features (Voigt 1983: 296). In semiarid aerobic environments, it is likely that many organic, nonmineralized materials have perished, in particular furnishings, fabrics, and objects made of wood, leather, fur, hair, and wool. Traces of baskets, reeds, and reed matting are widely preserved in the Zagros as "white" silica phytoliths (L. Braidwood et al. 1983: figs. 67–68, 93)

It is the smaller micro-artifactual and bioarchaeological remains that McKellar (1983) and Schiffer (1987) suggest are more likely to become primary refuse, even in areas that are periodically cleaned. Interpretation of micro-artifacts, bioarchaeological remains, and chemical traces of activities, however, is often problematic due to the complexity of depositional pathways, postdepositional alterations, sampling, and the routine extraction of materials from their depositional context by wet-screening, flotation, and sample processing (Clarke 1973; Hodder and Cessford 2004; LaMotta and Schiffer 1999; Metcalfe and Heath 1990; Saeedi 2010).

In an in-depth study of microarchaeological remains from wet-screening at Çatalhöyük, Hodder and Cessford (2004) noted that charred plant remains and fragments of bone and lithics were present even in a control sample of "clean" wall plasters, as materials incorporated into the architectural material, not as residues of activities. Given the thinness of many plaster floors and surfaces on sites in the ancient Near East, it is often difficult to excavate and sample separately (a) deposits and components related to floor make-up and plasters and (b) deposits related to activities on these floors and surfaces (Hodder and Cessford 2004; W. Matthews et al. 1997; W. Matthews 2005b). In developing microarchaeological methodologies for interpretation of household activities and life-histories, therefore, sampling and taphonomic issues need to be considered and appropriate comparative and control samples examined. Saeedi (2010) has identified clear differences in the microdebris on interior and exterior surfaces at the Ceramic Neolithic site of Tol-e Bashi in Fars, Iran, which indicate that interior spaces were frequently cleaned and maintained and that exterior areas were the locus of a range of productive and social activities and interactions, including stone-tool knapping and modification, food preparation and cooking, and periodic butchery. Where possible, interpretations could also be strengthened by integrated approaches that incorporate micromorphological analysis of indicators of the origin, precise depositional context and associations, and postdepositional alterations of micro-artifactual and bioarchaeological remains, as discussed in this essay.

Microstratigraphy as Evidence of Household Practices, Boundaries, and Life-Histories

In situ analysis of the materiality and temporality of surfaces and microarchaeological residues in buildings and settlements, both in the field and under the microscope in large resin-impregnated thin-sections, allows us new insight into household and community practices, boundaries, and life-histories, at high spatial and temporal resolution, independent of any changes in the architecture of buildings.

Ethnographic studies of traditional architecture suggest that archaeologists could readily identify activity areas (Kramer 1979) and explore the creation of social settings (Asatekin 2005) and ritual performance (Boivin 2000) throughout the life-history of buildings and settlements through greater attention to the study of architectural surfaces themselves, as well as traces of activities (Matthews and Ergenekon 1998; W. Matthews et al. 2000). It is in the central Zagros of Iran that Carol Kramer was one of the first to observe that "the floor of each area within a house compound is peculiar to that kind of area and therefore diagnostic of primary function . . . it is likely that an excavator could readily discriminate between roofed and unroofed areas, [and] . . . identify stables, storerooms, kitchens and living rooms . . . by evaluating variations in floors" (Kramer 1979: 148–49). In excavations of Hajji Firuz Tepe, Voigt (1983: 35) suggested that the differences in the types and thickness of floors and residues in different rooms and areas relate to differences in "behavior among structures as well as variation in the use of specific structures."

Architectural studies and theory suggest that surfaces and coatings may potentially be used to create settings and boundaries in three-dimensional space, partially or wholly independent of load-bearing members and potentially with much greater variability and frequency. Even in environments where there are similar materials or limited choice and resources, materials will gain significance from the specific circumstances of their selection, arrangement, and placement (Leatherbarrow and Mostafavi 2002: 23; Lévi-Strauss 1966: 21). De Botton (2006: 97) argues that there is no "dictionary" for interpretation of architectural form and materiality, as these are always context-dependent and historically-contingent. It is precisely this context-dependency and relationship of architecture and surfaces to specific histories of people and places (Leatherbarrow and Mostafavi 2002), however, that can be examined in the archaeological record, through a study of the types of surface materials, their spatial boundaries (extent and associations), and temporal frequency (duration and sequence); the impact of activities and events on these surfaces through analysis of surface deformation and accumulations of residues; and postdepositional alterations.

Examples are discussed here of microstratigraphic traces of household practices and life-cycles and histories from new excavations at the sites of Sheikh-e Abad and Jani in the central Zagros, Western Iran. These cases are compared to those from previous microstratigraphic research at the Neolithic site of Çatalhöyük in Turkey, where significant contextual variation in surfaces and residues within buildings has enabled study of both short- and long-term continuity and change in social, political, and ecological practices and strategies in individual households (W. Matthews et al. 1996; W. Matthews 2005a, 2005b). These examples are also compared to macroscopic observations from archaeological excavations at other sites in the Zagros region, from published excavations, where possible.

In the field, architectural surfaces and occupation residues were recorded in plan during excavation and in micro-stratigraphic section-profiles in strategic baulks, plinths, or the edges of pits and excavation trenches (IADB; R. Matthews et al. 2010, in press; W. Matthews 2005a, in press). These section-profiles were cleaned with an artist's palette knife, photographed, drawn at 1:5 or 1:10 scale, and recorded (W. Matthews 2005b). The type, thickness, frequency, and percentage of surfaces and deposits in different rooms and areas can be quantified and compared by measurement of each unit in a representative perpendicular line through each section profile and represented as a stratigraphic column (Matthews and Postgate 1994: fig. 15.9).

High-resolution microscopic analysis of sequences of floors and deposits in large resin-impregnated thin-sections, 14 by 7 cm, enables *in situ* simultaneous analysis of individual floor-plaster layers, which are often less than 0.5 to as much as 5 mm thick, and accumulations of diverse artifactual, bioarchaeological, and micro-artifactual components, and study of their predepositional, depositional, and postdepositional histories (Courty et al. 1989; W. Matthews et al.1997; W. Matthews in press).

In thin-section, component materials, morphology, and depositional processes were analyzed and recorded using an internationally standardized methodology adapted for archaeology (Bullock et al. 1985; Courty et al.1989; W. Matthews 1995, 2001; Stoops 2003), with reference to geological, soil, and biological atlases and ethnoarchaeological and experimental case-studies (W. Matthews 2005b). Although these thin-sections are small, there is a considerable replication in each sequence. In previous studies, trends in component concentrations and degrees of fragmentation correspond with those from larger samples from wet-screening and flotation (W. Matthews 2003, 2005b). Where possible, blocks of sediments were collected at one- to two-meter intervals within buildings for microscopic analysis of variation in surfaces and residues in large-resin-impregnated thin-sections, 13.5 by 6.5 cm, 25 to 30 µm thick, at magnifications of ×25 to ×400 (fig. 3; W. Matthews 2005b). 10 thin-section samples have been analyzed from open areas/middens and buildings at Sheikh-e Abad and Jani, further samples from excavations in summer 2008 will be analyzed in 2009–2010.

High-precision spot samples of deposits were collected for geochemical and phytolith analyses in the field from section profiles and surfaces and in the laboratory from the back of the thin-section blocks, prior to impregnation with resin, to enable direct comparison with results from micromorphological study of deposit composition and taphonomy. In the field lab, spot samples of deposits were also examined

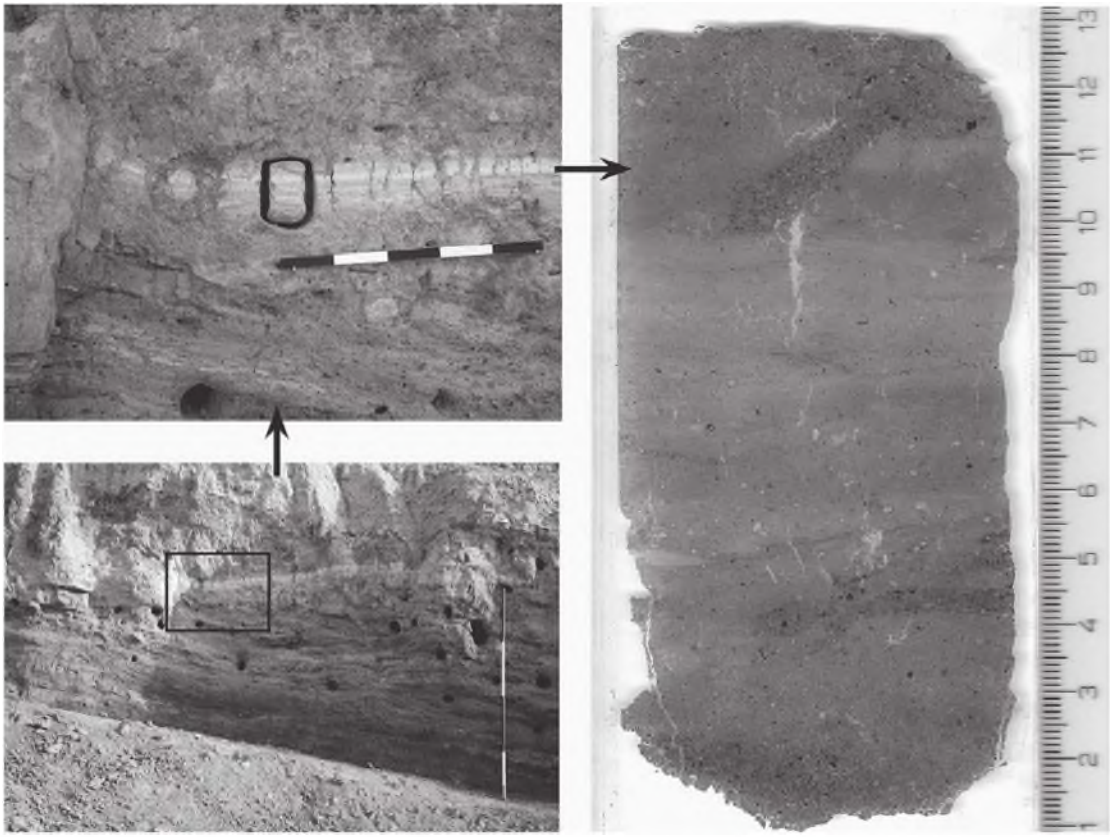


Fig. 3. Transition at Jani from midden/open areas to substantial architecture with finely plastered floors, which have been sampled as blocks for examination in large resin-impregnated thin-sections. Scales = 2 m, 50 cm, and 13 cm.

under an optical polarizing microscope at ×40 to ×400, in smear slides with clove oil as a nontoxic temporary mounting media, for immediate analysis and feedback as excavations were in progress on the composition of deposits. Components examined in the smear slides and thin-sections included phytoliths and calcareous dung spherulites from animal dung. Dung can otherwise be difficult to identify in study of charred plant remains from flotation, for example, and may be widely used as a fuel in semiarid sites (see fig. 9; Miller 1996; R. Matthews et al. 2010; W. Matthews 2010).

This chapter also considers the physical characteristics of interior and exterior areas in Neolithic sites in the Zagros and their social and cultural implications. It includes consideration of physical distance and zoning of activities on the basis of cross-cultural limits of human sensory perception, including sight, speech, and hearing (Bowser and Patton 2004: fig. 7; Moore 1986: 153–67). Spatial syntax (Hillier and Hanson 1984), orientation, light, and wind direction also have a major effect on the nature and perceptions of places and activities and associations and memories (Bachelard 1994).

In this and other studies, historical and ethnographic records of environment, settlement, and life-ways in these and other regions have been examined to widen and enrich the range of knowledge that can be drawn on to aid interpretation of archaeological remains and possible household ecological and social strategies and cycles (Abdi 2003; R. J. Braidwood 1961; Hole 1979; Hole 1979). In an increasingly industrialized and urban world, with mass production, shipment, and artificial preservation of food and widespread use of synthetic materials, it is vital that the rich knowledge and experience of other ways of life that are more closely interrelated with the environment and seasonal cycles and that employ different social and ecological strategies are not lost to humanity, nor ignored in archaeological interpretations of past communities. The use of this knowledge is not as direct analogy but as stimuli to thought and as a wider window through which we can examine traces of individuals and communities and consider different ecological and social strategies (W. Matthews et al. 2000).

Comparative micromorphological observations of surfaces and residues within houses from the Neolithic site of Çatalhöyük in central Anatolia, ca. 7400–6000 cal. B.C., are briefly considered here, as Çatalhöyük is an important comparative site for study of Neolithic households (Hodder and Cessford 2004; W. Matthews 2005a, 2005b, in press). At Çatalhöyük, micromorphological analysis of the type, thickness, and frequency of architectural surfaces and micro-residues on them, has shown how different surface materials were used to define marked spatial and sociocultural boundaries within households. Low areas for food storage, preparation, and cooking were delineated by grey or brown packing and plasters. Raised areas for sitting, sleeping, and subfloor burials were delineated by repeated applications of thin white silty-clay and occasionally red paint.

Analysis of the temporal frequency and sequence of surfaces and residues at Çatalhöyük has identified remarkable patterns and rhythms in the renewal and maintenance of buildings as embodiments of people and place and individual household life-cycles and histories. Examples include in the order of:

- monthly-seasonal (a) cycles of indoor and outdoor activities and social interactions, including food-cooking, and (b) white-washing of walls in the main rooms and annual renewal;
- periodic ceremonies associated with discard of ochre in hearth rake-out and wall painting;
- approximately 1-to-3-year replastering of platform surfaces, associated in some buildings with subfloor burials;
- 5-to-30-year renewal of storeroom surfaces, which, like their contents, were concealed from public view.

Analysis of end-life of buildings is providing insight into the individual histories of households. Some buildings were reduced in size and associated with a shrinking household (Building 1). Others were dismantled and deliberately in-filled shortly after last use (Building 5); used as latrines and/or for refuse (Building 2); or left to collapse (Building 3). Interdisciplinary study of how these life-histories of buildings correspond with the lives of individuals buried within them is providing rich evidence of how household and communities represent themselves and their interrelationships (Hodder and Cessford 2004; Hodder 2006; W. Matthews 2005b, in press).

Households and Communities in the Central Zagros

The Zagros region is of major importance to studies of early sedentism and households and the origins of agriculture, as the "hilly flanks" are a key heartland of wild animals and plants that were later domesticated (Barker 2006). Research here in the 1950s and 1960s was seminal in developing approaches and theories on the Neolithic transformation in human-environment interrelationships and the transition from mobile hunter-gatherers to settled village-farmers (R. J. Braidwood 1961; Flannery 1969). As discussed in the following section, there is considerable evidence for transformations from open-air sites with few or no architectural features to settlements with densely clustered architecture and then increasingly separate buildings. One of the earliest known records of domestication of goat, which was a key source of food, materials, wealth, and iconography for many societies in the past as well as today, is at Ganj Dareh, in the Central Zagros, ca. 7900 cal. B.C., based on the sparsity of male goats greater than two years old (Zeder 2005).

Although more secure ^{14}C dates are needed from the Zagros, a general chronological framework can be constructed for study of developments in settlement complexity and emergence of households. During the Younger Dryas cold climatic downturn, known occupation in the Zagros was purported to have ended ca. 10000 cal. B.C. in Shanidar Cave and at the open-air sites of Zawi Chemi Shanidar and Karim Shair, in the northern Zagros (Aurenche et al. 2001; R. L. Solecki 1981, R. S. Solecki et al. 2004). The earliest previously identified Neolithic sites in the Zagros were Tepe Asiab, ca. 8750 cal. B.C. (R. J. Braidwood 1961; Braidwood and Howe 1961), Tepe Abdul Hosein, ca. 8200–7600 cal. B.C. (Pullar 1990), and Ganj Dareh ca. 7950–7750 cal. B.C. (Smith 1990), based on AMS ^{14}C dates on bone provided by Zeder (2005) and ^{14}C dates from Pullar (1990) and L. Braidwood et al. (1983). New ^{14}C dates from CZAP excavations at Sheikh-e Abad, however, suggest that occupation may have existed in the Zagros during the later phases of the Younger Dryas and early Holocene, as occupation levels span ca. 9800–7600 cal. B.C. (R. Matthews et al. 2010). Later Neolithic sites close in date or contemporary with the main phases of occupation at Çatalhöyük, ca. 7400–6000 cal. B.C., include: Ali Kosh ca. 7550–7050 cal. B.C. at edge of the central southern Zagros (Hole et al. 1969); Chogha Bonut ca. 7050 cal. B.C. at the north of the Khuzistan Plain (Alizadeh 2003); Tepe Guran ceramic levels ca. 7050–6050 cal. B.C. in the central Zagros (Meldgaard et al. 1963); and Hajji-Firuz Tepe ca. 6,300 cal. B.C. in the northwest Zagros (Voigt1983). The ^{14}C dates for Jarmo, in the northern Zagros, are problematic, but L. Braidwood et al. (1983: 539) propose that occupation there spanned approximately 7250–5900 cal. B.C.

Based on archaeological excavation and survey in the Zagros up to the 1960s, Hole and Flannery (1967) proposed several models for Neolithic site types and ecological and social strategies, which principally comprised:

- *permanent villages* of 50–100 people, based on agriculture (predominantly but not necessarily cereal-based) and wild resources;
- *semipermanent seasonal camps or villages* of 50–100 people for herding with wooden or no detectable structures. The existence of seasonal camps both preceded permanent villages and continued contemporary with them;
- *pastoral camps in caves;*
- *transitory camps on seasonal transhumant routes.*

As early sedentary communities and households throughout the Near East may have developed from and continued to include periodic fission and fusion of populations to manage hunting, gathering, fields, and grazing, often seasonally (Fairbairn et al. 2005; Hole and Flannery 1967; Roberts and Rosen 2009), models of mobile and semi-mobile communities are important and highly relevant to the study of household and community structures. Abdi (2003), in the context of more recent survey and excavation in the Zagros, has examined ethnographic models of pastoralism. In particular, he highlights the potential differences in the age, gender, and socioeconomic identity of individuals and communities associated with different ecological and social strategies, as well as ways in which they might be detected in the archaeological record from study of material artifacts and site types. He observes that:

- *village-based herding* is generally proximate, less than one-day's travel from the village, or distant, less than one week's travel, and conducted by young boys and young adults;
- *transhumant pastoralism* comprises seasonal migration between winter pastures in lowlands and summer pastures, often by adult males who may be extended members of the household or hired shepherds;
- *seminomadic pastoralism* involves long periods away from the village-base by (a) the entire group or (b) specialists, often adult males;
- *nomadic pastoralism* comprises high mobility by entire groups, tied by strong kinship relationship, between lowland and upland pastures, which are usually owned by the group or based on reciprocal relationships and/or barter trade or services, with little or no agriculture, but often co-occurs with other strategies, and may not have developed until ca. 4500 cal. B.C.

In earlier ethnographic studies in the Zagros, Watson (1979) and Arshi and Kasraian (1994) had also observed cyclical seasonal changes in the social organization of semi-nomadic communities with a village base. They record that the fundamental household unit—the *ojaq*, a word that also may be translated 'oven'—may be a nuclear or extended family. During migration to summer pastures, households coalesce to form larger social groupings, the *obah*. When the group returns to their winter houses, this larger grouping loosens or dissolves, and most decisions are made within the family "oven/hearth" group. Although these archaeological and ethnographic models for this region consider ecological and social strategies for hunting and foraging, examples and models need to be developed further in order to stimulate investigation on how Neolithic households and communities managed diverse ecological strategies, as this is still poorly understood (Roberts and Rosen 2009). Such research is vital to develop our understanding of households as dynamic social, economic, and political groups (Moore 1986) and how households and communities articulated and engaged with each other (Brück and Goodman 1999).

The Central Zagros Archaeological Project (CZAP)

The principal aims of the CZAP are to investigate local and regional variation in environment, food procurement, diet, sedentism, and role of ritual in the central Zagros mountains and intermontagne plains, using a range of interdisciplinary techniques, including archaeozoology, archaeobotany, micromorphology, phytoliths, geochemistry, bioanthropology, and study of architecture, artifacts, and figurines (R. Matthews et al. 2010, in press). This project is comparing environmental and socioeconomic interactions and developments in the lower, warmer Zagros with those in the upland, cooler Zagros through excavation of two Aceramic Neolithic mound sites, 90 km apart on one of the major east–west routes through the region, later the Silk Road (fig. 1). These sites were identified by intensive survey in this region by the co-directors of excavations, Dr Mohammadifar and Dr Motarjem, Bu Ali Sina University, Hamedan, and by Dr. K. Abdi (2003). Preliminary ^{14}C dates suggest that the 10-m-high mound of Sheikh-e Abad may date from as early as 9810 cal. B.C. (10130 ±60 B.P.) and span key developments in early Neolithic ecology and settlement to 7590 cal. B.C. (8600 ±40 B.P.), filling, at least in part, a major gap in occupation in this region at the end of the Younger Dryas.

Sheikh-e Abad lies in the heart of the upland, cooler Zagros, at 1,430 m asl, in a fertile plain surrounded by 3000-m-high peaks. Three trenches were excavated in summer 2008 through 10 m of stratigraphy from the base to the top of the mound, and samples were collected for interdisciplinary analysis. In Trench 1, excavations reached natural sediments and investigated an early open area/midden, more than 1.5 m deep, at the southwestern edge of the mound. In Trench 2, areas of *in situ* burning, working surfaces, ash and fire-cracked stones, and traces of overlying architecture were excavated, ca. 6.4 to 8.9 m above natural desposits, from ca. 7950 cal. B.C. (8840 ±60 B.P.), at the western edge of the center of the mound. In Trench 3, excavation investigated substantial architecture and open areas, 13 by 10 m, at the top of the mound, in the center, ca. 7590 cal. B.C. (8600 ±40 B.P.; fig. 4). Jani is situated in the lower Zagros, at 1,280 m asl, in a region of valleys separated by ridges 1500 m high. Here an eroding section profile, 60 m long, through 8 m of deposit, was cleaned, photographed, drawn, and sampled to investigate successive changes from natural sediments at the base of the mound to (a) ashy deposits with fire-cracked stones, (b) ashy midden/open areas ca. 8160–7970 cal. B.C. (8860 ±60 B.P.), (c) pits and/or fire-installations, and, then, (d) well-constructed architecture (fig. 3).

Ecology and Diet in the Central Zagros

To date, some probable domesticated cereals have been identified from Sheikh-e Abad in Trench 2 from ca. 7950 cal. B.C. in archaeobotanical analyses of charred plant remains (Whitlam et al. in press). This, together with the abundance of charred pistachio and almond nuts, provides an important model for investigation of diet and the viability of sedentary settlements and households that have a mixed economy utilizing both domesticated and wild resources from at least ca. 7950 cal. B.C. The earliest attested domesticated cereal in the Zagros is barley, ca. 8000 cal. B.C. at Ganj Dareh. The full package of domesticated cereals and lentils is present at Jarmo, in the late 8th millennium B.C., and selected plants are present at other sites in this time frame (Charles 2008).

Animal and mollusc remains from these and other early Neolithic sites in the Zagros attest to a broad-spectrum diet including goat, deer, cattle, pig, equid, hare, fox, birds, crab, fish, clams, fresh water molluscs, and edible land snails (R. Matthews et al. 2010). Preliminary analyses of the CZAP 2008 animal bone assemblage suggest that the predominant age and sex kill-off patterns for wild goat are related to hunt-

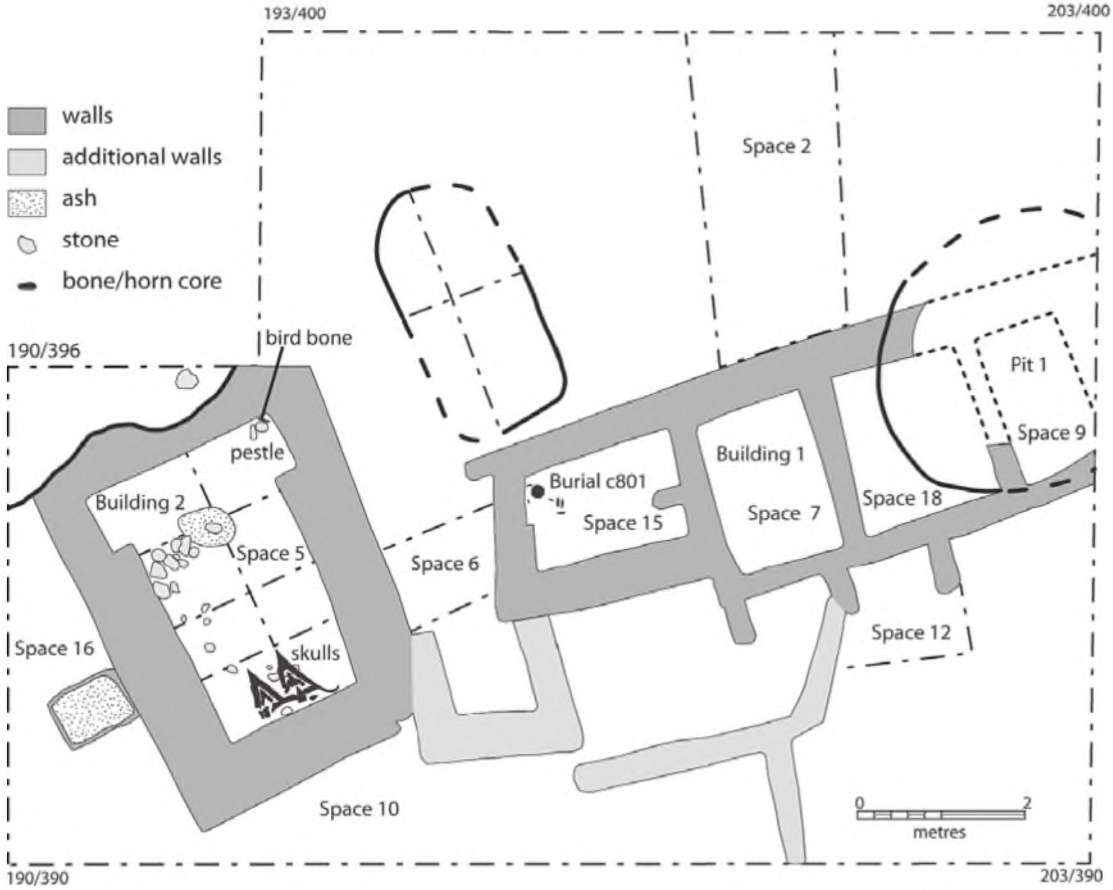
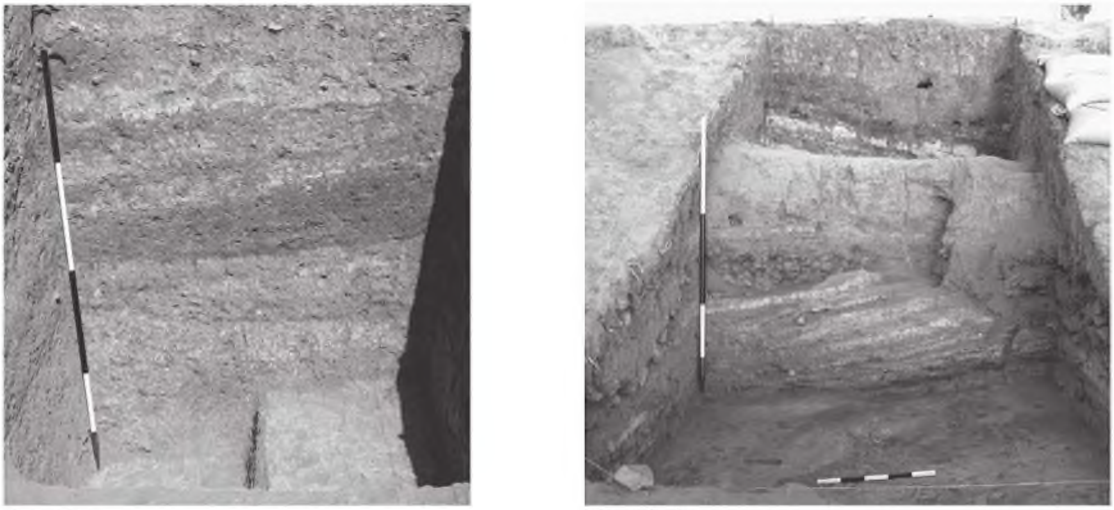


Fig. 4. Sheikh-e Abad Buildings 1 and 2 and open areas, Trench 3.

ing and possibly management of females and young, probably from nursery herds. Micromorphological identification of abundant burned and nonburned herbivore dung in many contexts at both sites attests to proximity to and perhaps incipient management of herbivores, from at least 8000 cal. B.C. onward (R. Matthews et al. 2010, in press).

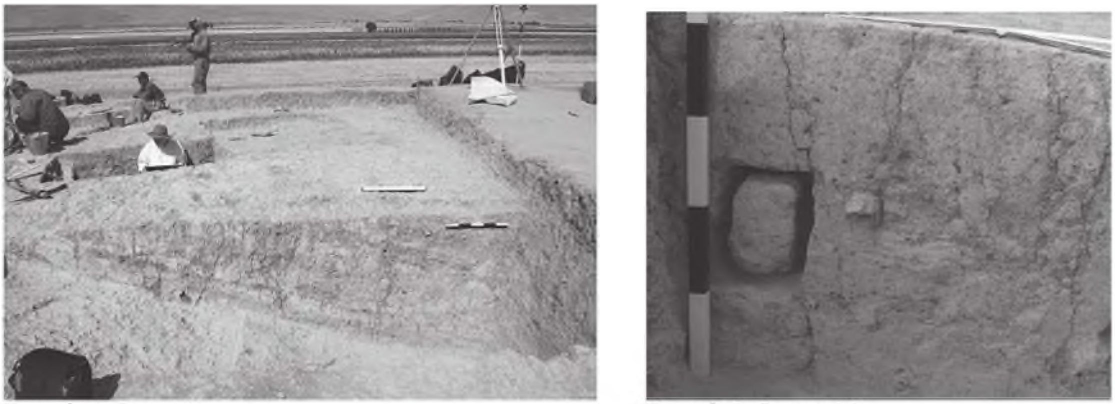
Early Neolithic Seasonality, Habituated Practice and Hearth-Focused Activities

Sites such as Asiab, Ganj Dareh E, and Abdul Hosein, like both Sheikh-e Abad and Jani, appear to have started as the location of periodic, perhaps seasonal, activities in open areas/middens, associated with burning, fire-cracked stones, traces of red ochre, figurines, and pits, some of which may have been used for storage. The specific nature and periodicity of activities in these early middens and exterior areas at Sheikh-e Abad and Jani is currently being investigated, building on interdisciplinary micromorphological, phytolith, geochemical, archaeobotanical, and archaeozoological research at other Neolithic sites and studies of seasonality more widely (Fairbairn et al. 2005; Monks 1981; Shillito et al. 2008). R. J. Braidwood (1961) suggested that the site of Sarab was a seasonally occupied camp for male herders, due



Trench 1

Trench 2



Trench 3, Space 2

Trench 3, Space 12

Fig. 5. Habituated practice and structured difference in the nature of activities in exterior areas at Sheikh-e Abad: repeated discard of ash in Trench 1; *in situ* burning in Trench 2; multiple layers of thick sloping packing and thinner accumulations of ash in Trench 3, Space 2; thin-lenses of ash and nonburned dung in Trench 3, Space 12.

to the insubstantial nature of the semisubterranean pit architecture with reed superstructure. Morales (1990), however, has argued that Sarab was occupied year-round, based on archaeozooological evidence (Bökönyi 1977), and by social groups that included women, based on the presence of up to 640 female figurines.

What is particularly significant is the repeated nature of activities associated with burning, figurines, and pits over time in the early levels of many of these sites, as it suggests routine, habitual practice (Bourdieu 1990). Exterior areas remain major features of Neolithic sites and communal activities after the development of substantial architecture. At Sheikh-e Abad, there are clear structured differences in the nature of activities in exterior areas, from repeated discard of ash in Trench 1, *in situ* burning in Trench 2, multiple layers of thick packing and much cleaner surfaces in the large sloping area in Trench 3, and thin-lenses of ash and nonburned dung close

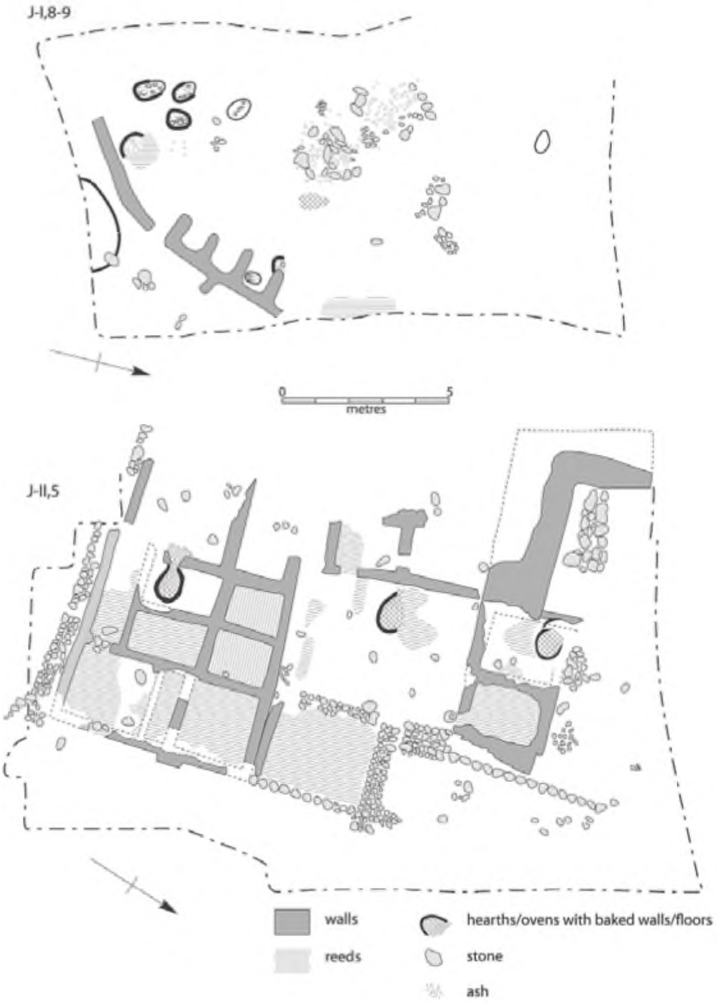


Fig. 6. Architectural development at Jarmo from: open areas with free standing walls and hearth/ovens and pits in J-I,8–9; to buildings with ovens in J-II,5 (after Braidwood et al. 2003, figs. 39 and 51).

to the alcoves, on the exterior southern wall of Building 1 in Trench 3 (fig. 5). These habituated practices suggest that there were well-defined patterns of socialization and organization (Carsten and Hugh-Jones 1995) and predictable interactions that are likely to have helped to allay social and political tensions (Bowser and Patton 2004; Jenkins 2004: 126), as independently suggested for the later Neolithic site of Tol-e Baši in Fars, Iran (Pollock et al. 2010). The early mounds of ash themselves may have represented individual and community wealth and status (Hodder 1987) and associations with place or land rights, including access to animals and woodlands for dung and wood fuel, rivers and marshes for fish, clams, fresh-water mussels, and reeds, and land for legumes and land snails.

Initial micromorphological analyses have identified traces of burned and non-burned fragments of construction materials in early midden layers at Jani and Sheikh-e Abad, which suggests the presence of architecture beyond these excavation areas. The basal levels of a number of sites in this region include short sections of walls, some with alcoves, as at Jarmo J-I,8–9 (fig. 6, L. Braidwood et al. 1983: figs. 39 and 86), that appear to be free-standing to provide a wind break, shade, or shelter.

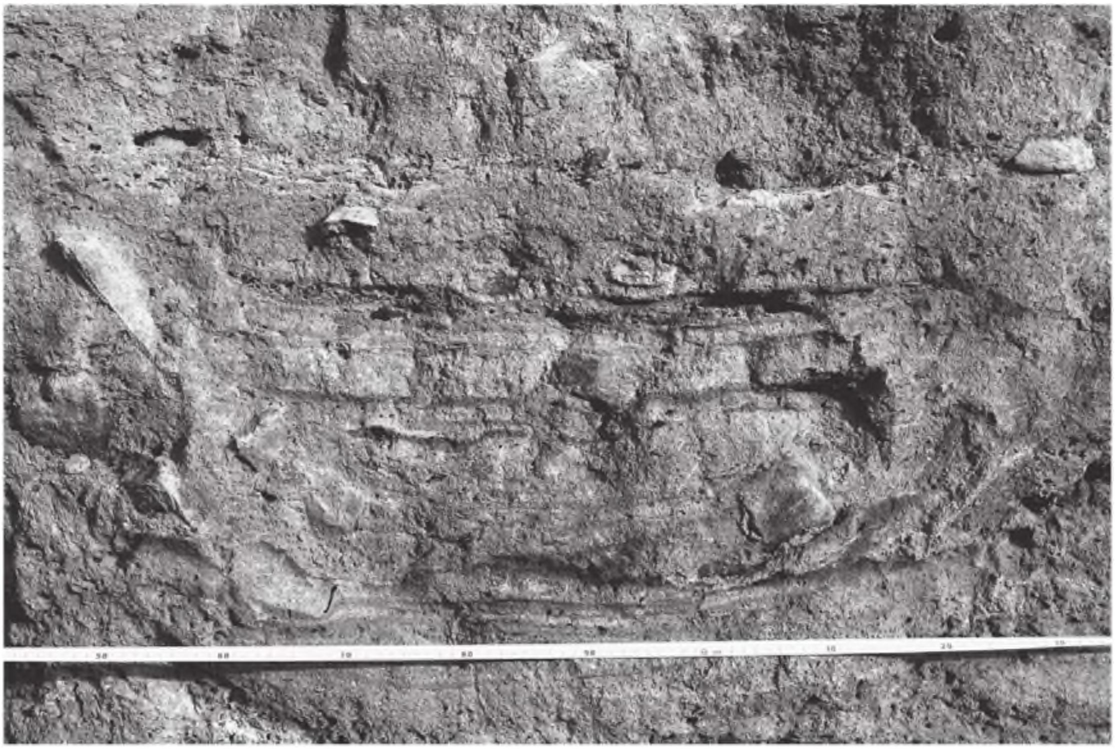


Fig. 7. Repeatedly plastered features at Jani, probably hearth/oven bases.

Repeatedly replastered features succeeding the open area/midden sequence at Jani (fig. 7) closely resemble the baked *in situ* features identified as hearths/ovens from the earliest level at Jarmo, in an exterior area J-I,8–9 (fig. 6; L. Braidwood et al.1983: 157, figs. 26–29). The context of these features at Jani is unclear, as they have been truncated by later leveling for the first substantial buildings in this area of the eroding section profile, at the extant northwestern edge of the mound. If freestanding in exterior areas, as at Jarmo, one possibility is that they could be the remains of hearths/ovens in plots of land that are seasonally reoccupied and reclaimed by transhumant or seminomadic households, as observed more recently in the Zagros (Watson 1979). Alternatively, they could be the remains of external hearths/ovens adjacent to buildings further to the southeast, in the center of the mound.

Hearths/ovens have an important role in the life and cosmologies of many societies, as places of belonging and transformation of materials, edible foods, and spaces of being, by their heat, smoke, and light (Atalay and Hastorf 2006; Hastorf 2001). Whether or not they are adjacent to buildings, the repeated replastering and reuse of these and many other hearths/ovens at Neolithic sites in the Zagros, up to approximately 10 times, as at Jani, attests continuity and attachment to places for food preparation, cooking, and heating and perhaps testifes to land rights and ancestral relationships, by hearth-focused and -related groups. The location in exterior open areas of hearths/ovens suggests that these hearth-related groups are likely to have engaged in communal interactions both in everyday life as well as during any feasts, as observed by Bowser and Patton (2004).

Architecture: Technology, Innovation and Tracing Household Life-Histories and Relationships

Hole et al. (1969: 343) suggest that mud houses may be "a type of architecture native to the lowland steppe" where building materials other than mud and clay are likely to have been scarce. They argue that the brick architecture at Ali Kosh, on the Deh Luran plain, is unlike the "hut circles" of Zawi Chemi, the "pit houses" at Asiab, or the "wooden huts" of pre-pottery Tepe Guran. However, the buildings at Ali Kosh have recently been re-dated and proven to be later than the basal levels of Zawi Chemi and Asiab (Zeder 2005). In addition, micromorphological identification of fragments of burnt and non-burnt building materials from early midden levels at both Sheikhe– Abad and Jani, priot to 8,000 cal B.C., at least 500 years before Ali Kosh, suggests that there was a long tradition of mud architecture in both the upper and lower Zagros.

Although the boat-shaped and hog-backed/cigar-shaped bricks of substantial architecture at Ganj Dareh D and other sites in the Zagros are similar to those at Neolithic sites as far afield as Jericho, there is considerable evidence for local experimentation and innovation in mud architecture in the Zagros, including stripchinneh (Smith 1990). Boat-shaped bricks were manufactured at both Sheikh-e Abad in Trench 2, and at Jani in the first level of substantial architecture in the exposed section profile. The variation in materials in individual walls and between different walls and possible units, at all of these sites, suggests small-scale organisation of the construction of these spaces and places. Of the latest preserved architecture in Trench 3 at Sheikh-e Abad, Building 1 is constructed of pisé/chinneh, Building 2 of small mud bricks.

The location in exterior areas of many ovens and hearths and the access to these, even when they are incorporated into rooms within buildings as at Jarmo J-I, 6b-d and J-II,5 (fig. 6; L. Braidwood et al. 1983: fig. 41 and 51), suggests that some cooking facilities may have been shared by several groups of people or households (Bernbeck 2004: 144), or at the very least that perhaps following earlier traditions use of hearths/ovens in exterior areas would have been a key social focus in which the inhabitants are likely to have engaged in more communal interactions both in everyday life as well as during any feasts, as observed by Bowser and Patton (2004). There may also have been other contributory rationales for their external location/access, including reduction of smoke and risk of fire in interior spaces.

Architectural Developments and the 'Emergence' of Households

Complex, clustered architectural units were constructed at Ganj Dareh, Level D, and excavated by Smith (1990) in a 14 by 10 m area exposure (fig. 2). Evidence of a burnt upper storey, is attested by impressions of wooden beams and reed ceilings in burnt mud floors that had collapsed into basal rooms (Smith 1990). The small basal rooms, less than 1.5 to 3 m in length and approximately 1.3 to 4.0 square m (fig. 2), include clay storage bins; mortars in settings; large and small previously un– or low-fired pots, the earliest in the Near East, probably for food storage, preparation and serving; scattered artifacts; and burials. Identification of individual households, however, is complex, for the range of reasons discussed previously. There was considerable modification through time of the location of walls, portholes and fixtures,

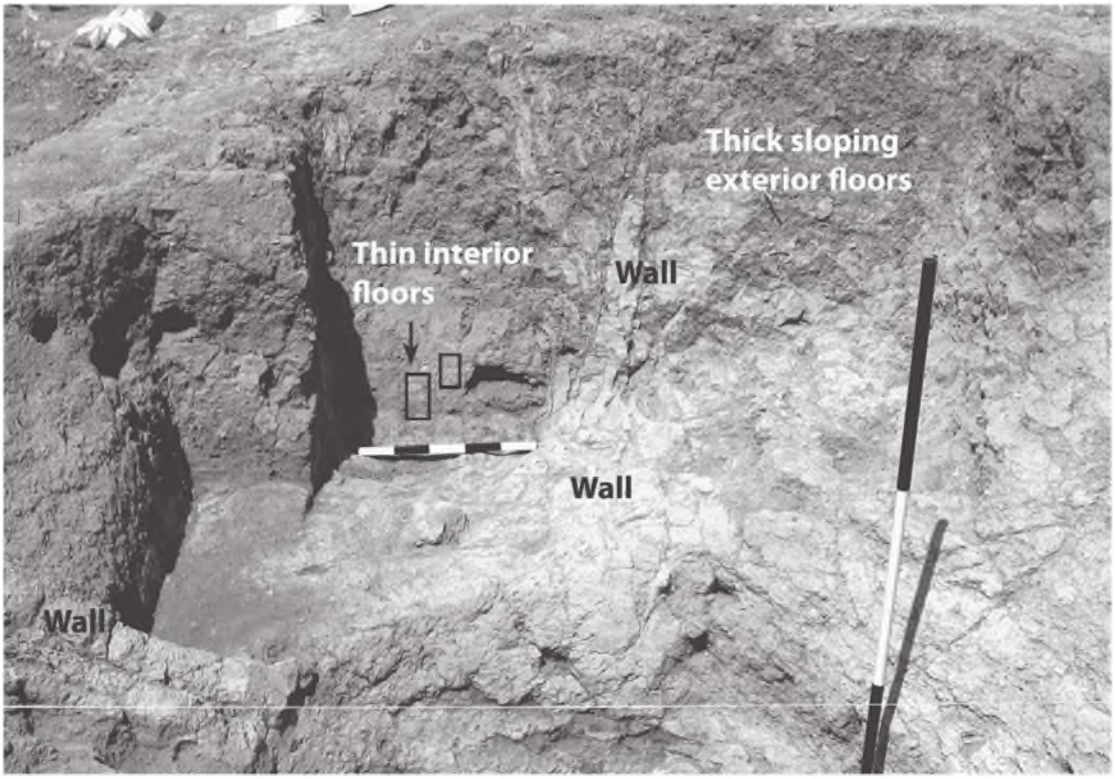


Fig. 8. Differential surface preparation and accumulation of occupation deposits in interior and exterior areas, Sheikh-e Abad, Building 1, Space 8 and exterior area, Space 2.

probably concomitant with changes in activities and social relationships (Smith 1990). Regrettably there is no final detailed publication of this complex architecture which could be used to trace the life-history of these buildings and the activities and interrelationships that they represent.

Sharing of party walls on a "property" boundary is common in the early levels of many Neolithic sites, and may suggest more communal or extended social and political interrelationships during the foundation and early history of settled communities, as at Jarmo (L. Braidwood et al. 1983) and Çatalhöyük (Mellaart 1967). In the later histories of these sites, there is evidence of increasing segregation into small, household-scale groups, defined by the construction of double walls in aggregated clusters of buildings, and at some point later, free-standing separate structures. Differences in the dates of sites and of the structures with these features of increasing separation and segregation, both within and between regions, suggests that these developments are not necessarily synchronous across the Zagros or other areas of the Near East but were more closely related to the histories and ecological and social strategies of individual communities and groups within these. Similarly, as Flannery (1969) argues, semimobile camps may have been constructed both by chronologically early Neolithic sedentary communities as well as by later Neolithic communities as hunting, gathering, or possibly pastoralist camps.

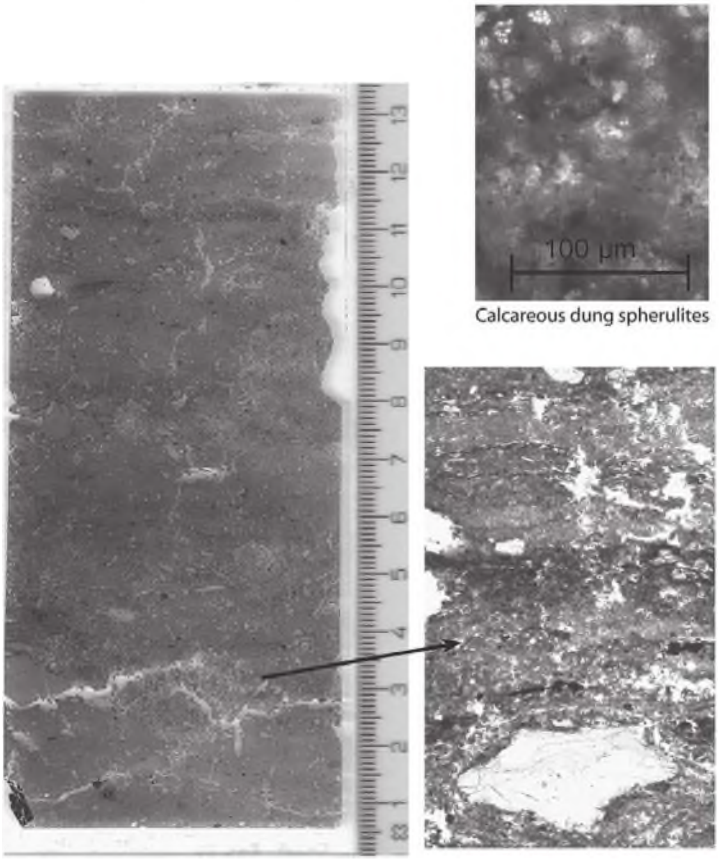


Fig. 9. Traces of early animal management and penning: interbedded lenses of herbivore dung with calcareous spherulites (top) and omnivore coprolites in Building 1, Space 8.

Microstratigraphy of Buildings at Sheikh-e Abad and Traces of Early Animal Management

At Sheikh-e Abad and Jani, we are seeking new insight into the dynamic life-histories of buildings and settlements and the socioeconomic and political organizations and practices that shaped them through analysis of microstratigraphic and micromorphological analysis of sequences of architectural surfaces and activity residues in different rooms and areas, in large resin impregnated thin-sections.

At these and other Neolithic sites in the Zagros, floors within buildings built up less rapidly than in exterior areas, in the order of approximately 5 to 20 cm within rooms, as in Building 1, and greater than 1.05 m in the adjacent exterior Space 2 (fig. 8). In the field, floors within rooms and buildings appear much "cleaner," with less ash than exterior open areas/middens. In thin-section (fig. 9), however, although the floor of a small interior room, Space 8, was lined with a thick packing, many of the accumulated layers on the floor, approximately 20 cm deep, comprise interbedded lenses of compacted herbivore dung and omnivore coprolites at least some of which are human, as identified by GC/MS analyses (Shillito et al. in press). These compacted layers of dung closely resemble those in animal pens from the Neolithic site of Çatalhöyük (W. Matthews 2005b) and ethnographic examples (Anderson and Ertuğ-Yaraş 1998).

Studies by Kramer (1979) and Watson (1979) illustrate how animals may be kept as part of a household within buildings on ground floors or semisubterranean areas, in the Zagros as in many regions of the world currently and in the recent past. Sheep, goats, and pigs are particularly vulnerable during winter and the spring birthing season, requiring close care. Herbivore dung has been identified in at least two exterior areas to the north and south of Building 1, at Sheikh-e Abad, confirming that although households in this community may not have been farming, they were engaged in intensive management of animals, which is likely to have included animal penning and/or storage of dung for fuel.

In the other small rooms of Building 1, sequences of floors in Space 7 comprise thin-grey lenses, approximately 5 cm deep, which have yet to be analyzed, while floors of Space 15 have yet to be excavated. Study of the spatial organization and relationship of activities throughout the life-history of this building requires further excavation of rooms to the east to complete the plan. The small size of the rooms, less than 1.2 × 1.8 m, 1.8–2.6 sq. m, the irregularity of their plan, and the buttresses on the walls, are very similar to structures at Ganj Dareh D, approximately 200–300 years earlier in date, ca. 7900–7800 B.C.

Microstratigraphy of Buildings at Jani: Technological Choices and Intensity of Focus on the House

The architecture at Jani, rising ca. 4.5 m above natural earth, comprises well-constructed agglomerated buildings, with separate but abutting walls, similar to houses at Jarmo and Çatalhöyük (fig. 3). The walls are constructed from boat-shaped bricks and are ca. 40 to 50 cm thick. The floors, like the platforms at Çatalhöyük, were repeatedly coated with thin layers of white-wash, many less than 1 to 2 mm thick, which were kept scrupulously clean and covered with mats/rugs, which left undulating surface impressions. These repeated white-washes, in sequences ca. 10 to 25 cm thick, attest an intense focus on the house as a unit and embodiment of people and place (fig. 3; Bachelard 1994; Leatherbarrow and Mostafavi 2002) through the embedding of repeated practice in its reconstruction and the events and temporal rhythms associated with these, as at Çatalhöyük and other sites in the Near East (Boivin 2000; Hodder 2006; Kuijt, 2000, 2008; Kuijt and Goring-Morris 2002; W. Matthews 2005a, 2005b).

Although these white-washes are similar in appearance to those at Neolithic sites in other regions, the technological choices, manufacturing techniques, and material properties are different. In thin-section, it is evident that, although these surfaces are white and of similar thinness to the silty-clay floors at Çatalhöyük from Level XI, the white-washes and plasters at Jani were made, at least in part, from highly fired white calcitic ash from burned dung, mixed with calcitic sediment, to create a hitherto undocumented, thin lime-like material, which is comparatively hard, durable, and waterproof (fig. 10).

Özdoğan and Başgelen (1999) and Kingery et al. (1988) discuss the widespread use of fired-lime in the Neolithic and its transmission as a shared knowledge of pyrotechnology, predating the production of pottery. That production of fired-lime was known in the Zagros region is attested by the white calcitic dung paste used in the floors at Jani (fig. 10), although the thin applications of this material are more like later nonfired lime floors at sites like Çatalhöyük (W. Matthews 2005b). Thicker

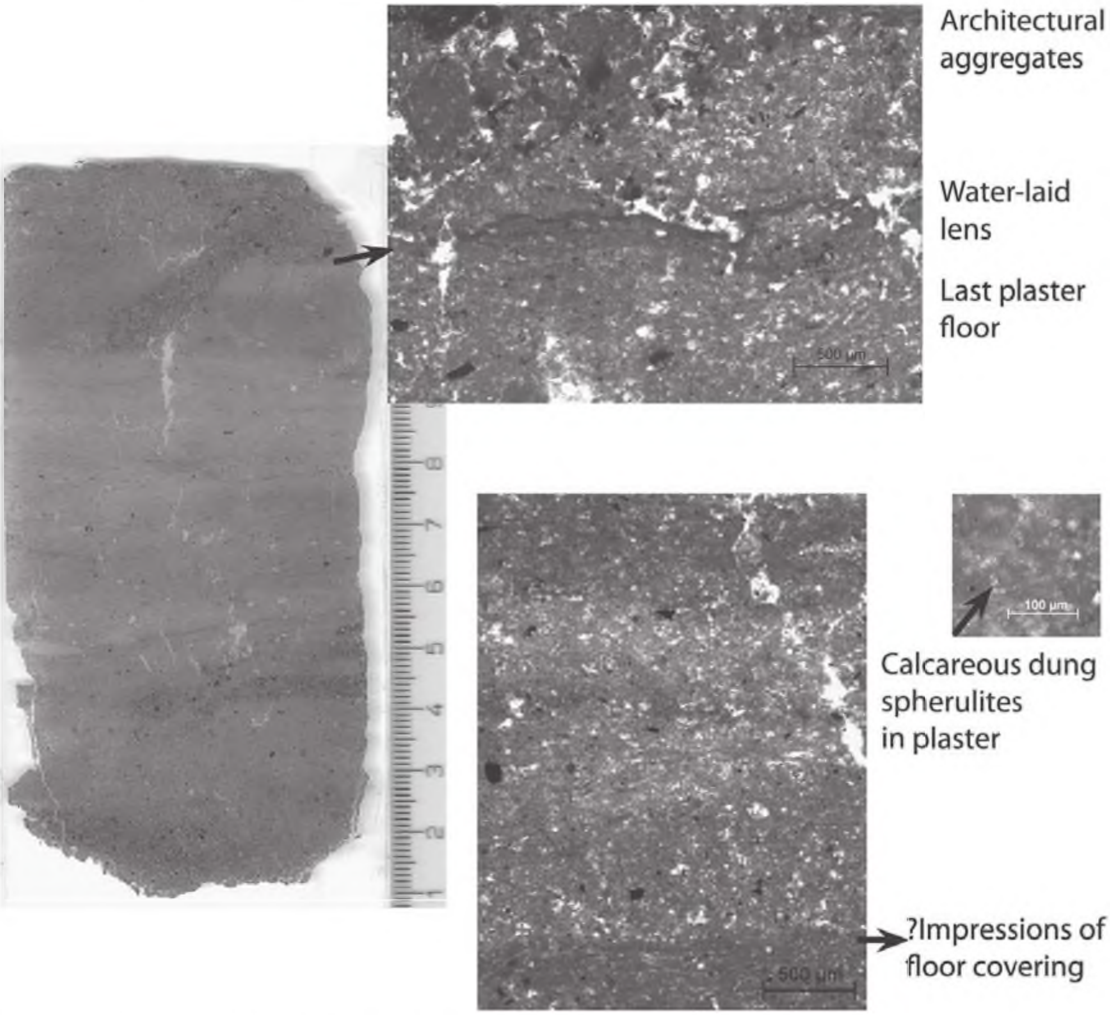


Fig. 10. Intense focus on the house and interior place at Jani, attested by repeated surfacing and cleanliness of floors, made from fine white plaster with calcitic ash from dung. Impressions of floor coverings on some surfaces. Water-laid lens on latest floor probably from period of abandonment/roof decay.

white lime/gypsum plaster and terrazzo clay floors covered with red ochre are known from Tepe Guran I, Levels E and J (Meldgaard et al. 1963). The unusual production at Jani of a mixed calcareous paste made from dung ash mixed with sediment suggests that, although there was some regional variation in the materials and technologies employed in the production of white-wash and white plastered surfaces, the concept of the house with a repeatedly reconstructed, often white, space was shared across different regions and phases of the Neolithic of the Near East to a degree and intensity rarely attested in later periods. Although only two buildings were analyzed at Jani, the similarity in technology and frequency with which they were resurfaced and thereby renewed supports Voigt's argument (1983: 311) that households or minimum residential units in the later Neolithic in the Zagros maintained at least a semblance of shared sociocultural values and economic homogeneity, at least as expressed in the materials and maintenance of individual houses.

The temporal rhythms and/or life histories of the two buildings at Tepe Jani, however, varied. The thin white floors in the floors in the East Building accumulated to a depth of at least 25 cm, but those in the West Building to only 10 cm. Carsten and Hugh-Jones (1995: 126) note that architectural modifications and alterations, including, replastering and cleaning are often "made to coincide in various ways with important events in the lives if their occupations and are thought of in terms of them."

Repeated white-washing of floors at the lower Zagros site as at Jani has thus far not yet been attested at other sites in the Zagros and may be dependent on the proximity of Jani to the central gateway to the Zagros from the plains and regions to the west. Reexamination of published reports of Neolithic sites in the Zagros, however, does reveal that interior areas of buildings were frequently resurfaced in mud plasters. In the early Neolithic, floors and some walls were coated with smooth mud plaster, including buildings at Ganj Dareh levels B–D (Smith 1990) and Tepe Abdul Hosein (Pullar 1990), although there are not many details on these features. In the later Neolithic, at Hajji Firuz Tepe, ca. 6300 B.C., walls were replastered up to 10 times, with foundation layers and thin white-washes 0.1 to 0.2 mm thick, some painted with black and red paint in geometric patterns. The floors of living rooms were plastered up to 12 times, with yellow silt plaster mixed with lime, from less than 1 up to 5 cm thick, with smooth level surfaces, and occasionally painted with red ochre or black pigment. By contrast, side-room floors were coated with thick packing or thin yellow plaster and were often irregular or sloping, and storage areas were plastered with repeated yellow plasters, occasionally with gravel. These internal differentiations and boundaries in the type and frequency of materials and surfaces between rooms and areas for reception, storage, and food preparation and cooking is not unlike that at Çatalhöyük, (W. Matthews 2005a, 2005b) , although the main rooms at Hajji Firuz Tepe were not replastered as frequently. Some of these differences in selection of materials may be related to environment or consideration of functional properties, including surface hardness, penetrability, and water-proofing, for example, and others may be related to aesthetics and natural and cultural associations (Leatherbarrow and Mostafavi 2002) and construction of spatial and social settings and boundaries.

Micromorphological analysis of the very fine floors within buildings at Ali Kosh might reveal that some of the thin-lenses were thin mud plasters (Hole et al. 1969: pls. 6–8). The thinness of these accumulations of deposits within buildings at least provides evidence that rooms were frequently swept to create and maintain a well-defined space and place. Some of the floors at Jarmo appear to have been covered in reed mats, some of which have traces of red ochre on them, possibly like painted reed mats and screens used by seminomadic communities more recently (Arshi and Kasraian 1994). In the Zagros, some exterior areas also appear to have laid surfaces and been constructed spaces, including the stone pavements at the Epipalaeolithic site of Karim Shahir (L. Braidwood et al. 1983), Ali Kosh Bus Mordeh phase, and Jarmo. Some indications of thick plasters in open area surfaces have been identified in early levels at Sheikh-e Abad and Jani (R. Matthews et al. 2010), and at Tepe Abdul Hosein 9-G2–3, 10-G-1–9 (Pullar 1990), and later Neolithic gravel pavements in entrances at Hajji Firuz Tepe (Voigt 1983).

End-Life of Buildings

The end of the life of buildings is also a testimony to the life-history of households (W. Matthews 2005a). At Asiab and Sarab, possible pit-like dwellings and traces of reed architecture were in-filled and covered by refuse, which included thousands of coprolites, which R. J. Braidwood (1961) suggests may be human. This abandonment and reuse of houses as refuse areas and, possibly, latrines suggests less attachment to and perhaps sense of ownership of specific lots within a site and more lateral, flexible shifts in location of structures, although piles of refuse and ash themselves may be indicative of status and property (Hodder 1987). The repeated construction of buildings on the same lot at Jarmo, although of slightly different and evolving plan, suggests some continuity in associations of people with place within a settlement at the same time when segregation and separation were increasing, with a reduction in the number of shared party walls (fig. 6; L. Braidwood et al. 1983). In thin-section, the accumulation of a thin lens of water-laid sediment on the last floor surface of the West Building at Tepe Jani may suggest a short period of neglect/decay of the roof and cessation of occupation, prior to infilling/collapse of the structure, with architectural debris.

Household Ritual Practices

The setting of sheep skulls into a niche in a room in a cluster of rooms and buildings at Ganj Dareh, Level D (fig. 2), appears to be similar to house-based "rituals" at later sites like Çatalhöyük. The room at Ganj Dareh, however, is very small, 1.1 × 1.3 m, closer to the size of platforms at Çatalhöyük around which skulls were set. The social distances within the room at Ganj Dareh are clearly of an intimate, rather than social, scale (Bowser and Patton 2004: fig.7; Moore 1986).

At Hajji Firuz Tepe, Voigt (1983: 314–16) suggests that Structure VI, ca. 3.5 × 3.5 m, may have had a ritual function, separate from houses, with plastered podium, human and animal bone deposits, and no oven. The plan of Building 2 at Sheikh-e Abad (fig. 4) is distinctive for its separation from Building 1, wider walls and their construction in small bricks rather than rammed earth, larger room size, and its possible shrine-like features (R. Matthews et al. 2010). At the end of a comparatively large T-shaped room, four wild-goat skulls, one with ochre on its cheeks, and a probable wild-sheep skull were placed on the floor. A large bird bone was placed in the northeast corner next to a pestle-like grinder. This T-shaped room, although small, is larger than others at the site, 3.4 × 1.9 m, creating clearly larger distances that are social rather than intimate. The floors are remarkably uneven and were covered in an irregular scatter of red ochre, charred plant remains, and stones in earthen architectural debris. It is likely that these surfaces represent the end-life of the building, similar to those in buildings at Jarmo. Earlier phases of the building have not yet been excavated.

In conclusion, therefore, some ritual practices were conducted in small, intimate spaces, closely linked to areas for food storage and production, as at Ganj Dareh, and may have been linked to household life-cycles and histories, as at Çatalhöyük (Hodder 2006). The construction of a separate, possibly cultic, building at Sheikh-e Abad, however, suggests that some communities had separate and possibly more community focused structures for ritual practices alongside or in place of those in more intimate contexts, as at Aşıklı Höyük (Esin and Harmankaya 1999) and Çayönü

(Özdoğan and Başgelen 1999), for example. Where these types of structures coexist, there may have been dual or multiple allegiances.

Burials as Evidence of Households

The placement of burials within buildings provides some indication of the associations of individuals and groups with buildings and houses at particular points in time, although those interred may only represent a portion of the population associated with a particular place and may not have been resident (Kuijt 2000). Burial practices within any structure may also be highly variable.

A full review of burials within houses in the Zagros is beyond the scope of this chapter. As an example of the nature and range of burial practices and interpretations that can be drawn from them, we can note that at Ganj Dareh, like other sites, there were individual, multiple, and secondary burials, in this case of 69 individuals from the excavations by Smith (1990). Although there is excellent published and unpublished research on the human remains (Meiklejohn et al. 1980, 1992), plans showing the locations of these burials have not yet been fully published, thus preventing in-depth analysis of associations between individuals, rooms, and houses. The interim reports record that burials were placed in niches, below floors, and in one instance in a "sarcophagus." One possible household group of two adults and four children was placed in a room connected by a porthole to the room with the niche with sheep skulls. Analyses of growth lines in teeth and of long bones suggest that, although infants under the age of three show signs of stress, older individuals developed fully and lived in a hygienic built environment (Meiklejohn et al. 1980, 1992), in contrast to populations at the Proto-Neolithic site of Shanidar (R. S. Solecki et al. 2004).

Six Neolithic burials were excavated during the 2008 season at Sheikh-e Abad in Trench 3 from the latest levels of occupation (R. Matthews et al. 2010). The bodies were tightly flexed. The burials were of one infant below the latest floor in Space 15, Building 1 (fig. 4), and four males of late teenage and late adult age, probably below the floors of an eroded structure above Building 1. Two burials have traces of red ochre. The dental attrition suggests a hunter-gatherer rather than a cereal-based agricultural lifestyle (Cole in R. Matthews et al. 2010, in press).

One of the most poignant associations of individuals with a building in the Zagros is the burial below building collapse, probably from an earthquake and/or fire, of an adult female cradling an infant and an adult male huddled together in a building at Tepe Abdul Hosein (Pullar 1990). It is tempting to suggest that these individuals might represent a nuclear household comprising father, mother, and infant, but as there is no DNA evidence and the building plan is incomplete, the relationship between these individuals and the building they are in cannot be explored further at present.

Conclusions

This essay has illustrated some of the avenues that can be explored through high-resolution analysis of microstratigraphic sequences in buildings and exterior areas and the rich range of evidence for the development of households and communities in the Neolithic of the Zagros. All Zagros sites attest repeated habituated practices that suggest that there were well-defined patterns of socialization and organization in both interior and exterior areas, which is likely to have helped in managing and allaying social and political tensions (Bowser and Patton 2004; Brück and Goodman 1999; Jenkins 2004). The range of structured activities in exterior areas as well as within buildings highlights the importance of a multi-sited approach that does not atomize households and the activities and social interactions in which they were engaged.

Within the Zagros, there is evidence for local development of architectural traditions that pre-date ca. 8000 cal. B.C. and for increasing separation of communities into individual household groups that are more clearly defined by separate walls, interbuilding spaces, and an intense focus on maintenance and renewal of the house. The apparent variation in dates suggests that these developments may be more closely related to the histories of individual communities than a synchronous regional change.

Microstratigraphic identification of the repeated white-washing and renewal of buildings at Jani suggests an intense focus on the house as a well-defined social setting and embodiment of people and place (Leatherbarrow and Mostafavi 2002) and on constructing and maintaining social relationships and continuity through the embedding of repeated practice in the construction of houses, as at Çatalhöyük and other sites in the Near East (Hodder 2006; Kuijt, 2000, 2008; Kuijt and Goring-Morris 2002; Watkins 2004). A systematic program of ^{14}C dating, Bayesian statistics, image analysis, and measurement of these multiple replasterings, however, is required to investigate in more detail the cycles and histories of practices in buildings and other areas, as explored at Çatalhöyük (Hodder and Cessford 2004; W. Matthews 2005a, 2005b, in press; Tringham and Stevanovic in press).

Some highly-charged, arguably ritual practices (Bradley 2005; Whitehouse 2004) appear to have been embedded within houses and house-based activities in the Zagros, as at Çatalhöyük (Hodder 2006), and would thereby have emphasized further the importance of the house and those associated with it. These house-based practices include the enshrinement of selected individuals within specific buildings and places after death, in subfloor burials; and the emplacement of sheep skulls in a niche at Ganj Dareh, ca. 7900 cal. B.C., which is one of the earliest symbolic features using animal skulls in the Near East to date. Hearths and ovens, often in exterior areas, were also important foci and are likely to have been of central importance in household and community sharing of food, stories, and memories (Atalay and Hastorf 2006; Bowser and Patton 2004), they, too, were repeatedly plastered and maintained.

Some ritual practices and, by association, the people engaged with them, however, were separated from other buildings and houses. One of the clearest and earliest examples of this in the Zagros is the T-shaped Building 2 at Sheikhe-Abad in which were placed four wild-goat skulls, one of which is painted with ochre, a wild-sheep skull, a large bird bone, and scattered ochre and charred plant remains on the floor. This distinctive structure enclosed and separated these materials, people, practices, and place from everyday household and community associations and reified them at specific moments in time. One aim in this spatial and temporal separation is likely to have been to define specific relationships and associations (Bradley 2005; Hastorf 2001). Further excavations are required, first, to investigate the early phases of this building to understand the nature and temporality of activities throughout its life-history, and second, to ascertain its wider spatial and social context.

The potential periodicity of household and community activities and the fission and fusion of populations at seasonal and other timescales, proposed for other regions (Atalay and Hastorf 2006; Fairbairn et al. 2005, W. Matthews 2005b; Rosen and Roberts 2009), has been explored in early and more recent research in the Zagros (Hole and Flannery 1967; Abdi 2003) and is currently being investigated in the Central Zagros Archaeological Project. New and future open-area excavations and survey in the Zagros at these and other sites will enable recovery of more complete plans of buildings and settlement areas and different types of sites and thereby greater contextual analysis of the social groupings and relationships represented and defined in the life-histories of architectural surfaces and boundaries and the traces of activities associated with these.

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Section 3

Food and Subsistence at the Household Level

Feeding Households:
A Multiproxy Method for Analysis of Food Preparation in the Halaf Period at Fıstıklı Höyük, Turkey

Marie Hopwood and Siddhartha Mitra

Introduction

In the course of the last few decades, discussions of households have taken new directions within the archaeological community. The term "household" has been variously applied to everything from socioeconomic units made visible through architectural structures (i.e., houses) to family relationships as defined by buildings. Some current discussions of households question if the physical building structure is necessary at all (Rosen this volume). Is a household defined by the structure, or is the group of people who have chosen to live and work together in a specific space the determining factor? How are our conceptualizations of archaeological households affected by our own ideas of houses and homes? Within this volume alone, multiple definitions of "household" are explored, some of which are inconsistent with others. This statement is not meant as a criticism but an acknowledgment that the term "household," which can seem uncomplicated at first glance, is still being defined archaeologically. In this chapter, we define a household not as a social unit bounded by a structure but instead as a group of people who choose to live and work within an area while sharing a set of goals. The exact nature of these goals and relationships may not be knowable today, but their effects are visible in archaeological remains. It is this cohesion among people who may or may not have been kin that is compelling; and the living environment as defined by households thus gains a significant but perhaps temporary value.

This chapter builds on the assertion that, archaeologically, it is not as important to know who the household members were as what they did (Ashmore and Wilk 1988: 3; Wilk and Netting 1984). Whatever the reasoning behind its formation and cohesion, one basic function of a household arguably is to feed and provide for its members (Atalay and Hastorf 2006: 283). The preparation of food affects relationships, the structure of the household unit, and the way that it functions on a day-to-day basis. Food and the practices of its preparation, therefore, can be closely woven into discussions of community cohesion and household function.

We examine the evolution of household function through the changing occupation at Fıstıklı Höyük, a Halaf Period hamlet situated in what is today the nation-state of Turkey (Bernbeck et al. 2002, 2003; Pollock et al. 2001; Pollock and Bernbeck 1998). Specifically, we posit that, by examining how food preparation at this site changed over a short period of time, we can also make inferences about the shifting function of households within the larger community. A unique aspect of this study is the use of a multiproxy approach to reconstructing food preparation at Fıstıklı Höyük by coupling the techniques of ceramic-use alteration (Arthur 2003: 332; Griffiths 1978: 69; Hally 1983: 22; Kobayashi 1994: 128; Rice 1987: 232; Skibo 1992: 105) with the characteristics of bound organic residues (Charters et al. 1993, 1997; Evershed 1993; Evershed et al. 1990, 1992, 1995; Heron and Evershed 1993) within the sherds found in the Halaf Period buildings. This analysis is carried out with the coarse-ware pottery.

Coarse-ware pottery can be a powerful tool of inference for examining how households provided for themselves. The coarse ware from Fıstıklı Höyük is relatively low-fired, resulting in ceramic surfaces that retain visual evidence of the activities for which they were used. Repetitive actions, such as stirring the contents of a pot, can leave scratches and areas of abrasion around the interior body and basal walls of a vessel. If the pot was used to heat food, fire-soot and food-carbonization deposits can mark both exterior and interior surfaces. Furthermore, invisible food residues can be absorbed and retained within the vessel walls. As explored here, the analysis of archaeological ceramics and their various traces of use can be used to infer causal activities and therefore to address larger questions involving the evolution of social structure and household function.

Study Site Description

Fıstıklı Höyük is a small site occupied for at most 100 years during the early Halaf Period in the early 6th millennium B.C., with a secondary ephemeral occupation during the Roman–Byzantine Period (Bernbeck et al. 2002, 2003: 20; Campbell 2007; Pollock et al. 2001; Pollock and Bernbeck 1998). Initial excavation was prompted by the potential of site-inundation by the Carchemish-damming project. While myriad other sites are now submerged under the Euphrates River, Fıstıklı Höyük and others nearby, including Zeytinlibahçe, were not affected. The site was excavated by a team lead by Susan Pollock and Reinhard Bernbeck between 1999 and 2000. Subsequently, in 2004 and 2006, one of the authors carried out study seasons on the coarse-ware pottery from the site (Hopwood 2010).

The site of Fıstıklı Höyük was established on a low-lying natural hill, flanked to the west by the Euphrates River and to the south by a small stream rushing westward to join the river (figs. 1 and 2). The settlement encompassed 0.5 ha at the top of the hill, and at the height of its occupation consisted of at least five domestic structures with associated storage units, hearths, ovens, and earthen constructions. Preliminary floral and faunal analyses, as well as environmental studies of similar areas, suggest that the site's surrounding landscape would have been riverine in character, rich in both plant and animal life (Bernbeck et al. 2003; McCorriston 1992; Zeder 1994).

Early in the Halaf Period, the settlement at Fıstıklı Höyük underwent a number of changes. It began as a temporary encampment with minimal modification to the

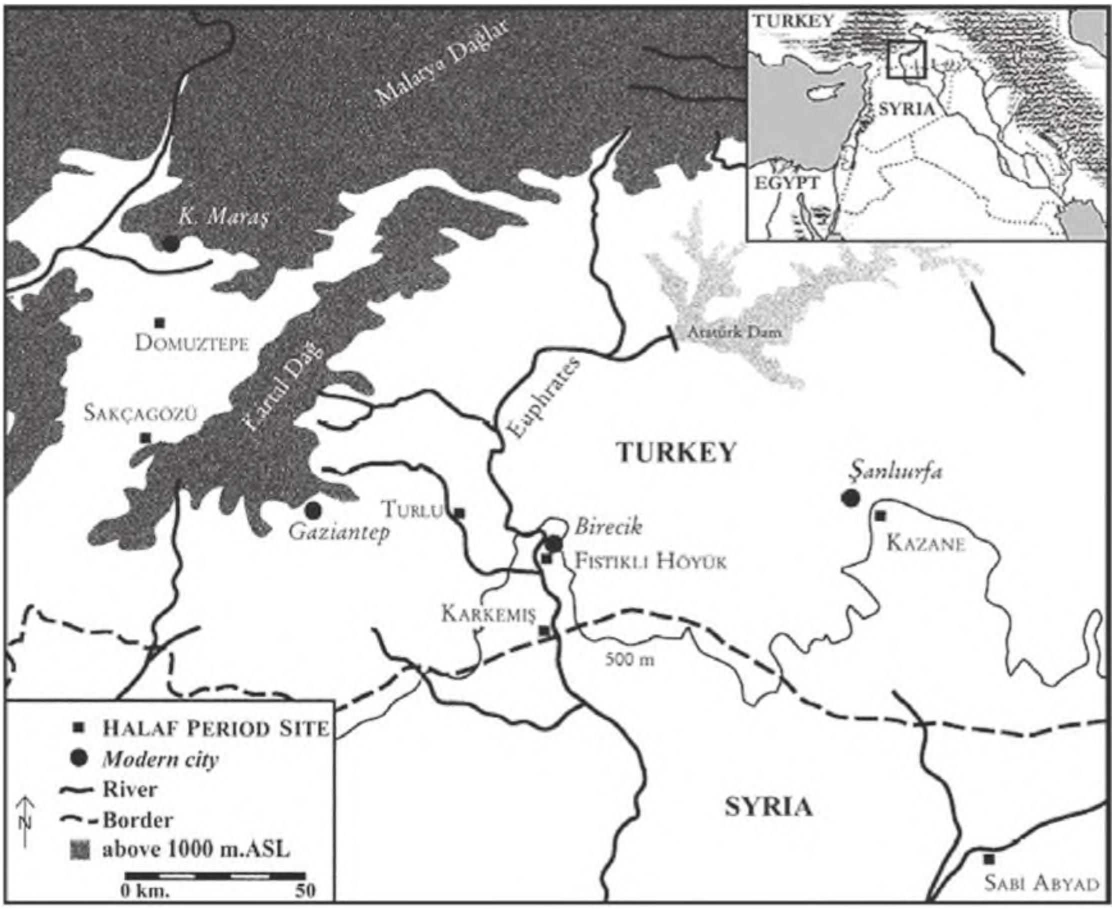

Fig. 1. Regional map of the modern nations of Turkey and Syria with the location of Fıstıklı Höyük located in southeastern Turkey.

mound. As the site's usage changed, structures were added for longer-term occupation and to support an increased population. Shortly thereafter, the structures were abandoned and the people moved on, only having occupied the site for as little as 50 to 100 years (Bernbeck et al. 2002, 2003; Campbell 2007; Pollock et al. 2001; Pollock and Bernbeck 1998). It is through the course of this occupation and eventual abandonment that evidence of the changing practices of food preparation at Fıstıklı Höyük can be used to determine the changes in the community and its constituent households in size and function.

Collection

The primary tool-type used in food preparation at Fıstıklı Höyük was pottery, specifically the coarse wares (Hopwood 2010). This assemblage consists primarily of sherds, with few complete vessels. The sherds were divided into categories based on their rim, body, and base characteristics (Table 1). Based on relative restrictions to vessel orifices, two broad categories—restricted and unrestricted vessels—were created (Table 2). Vessel restriction is a characteristic that relates to the ability to access

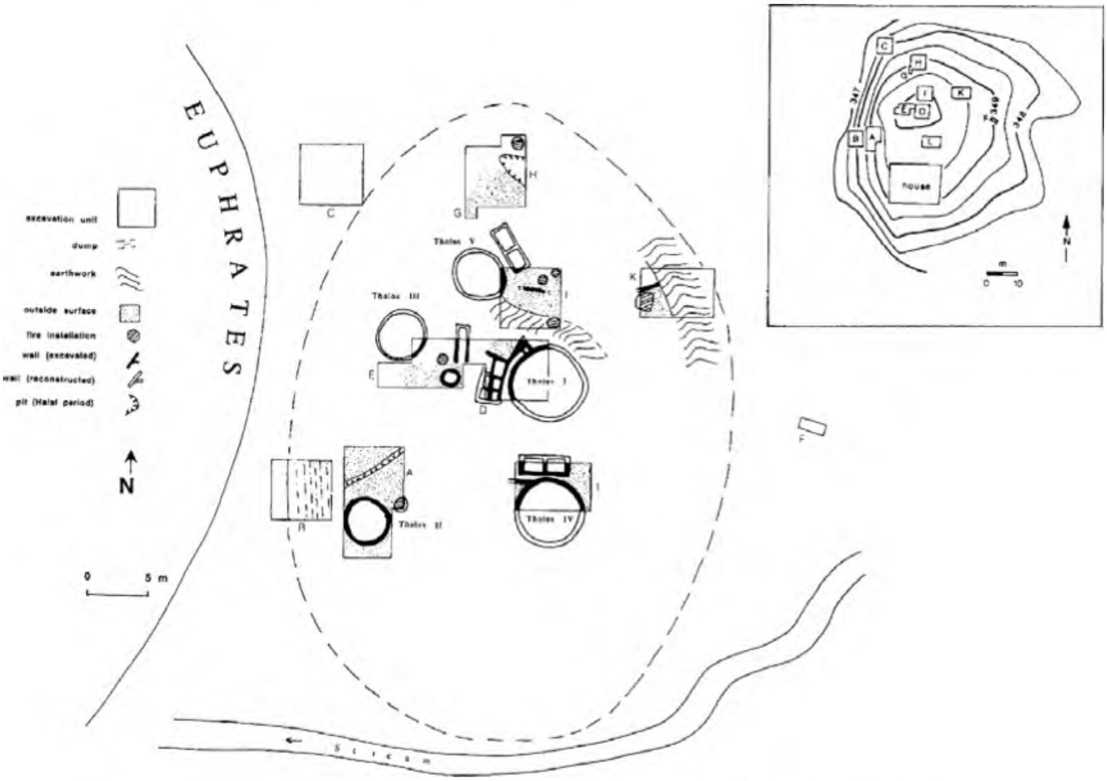

Fig. 2. Site map of Fıstıklı Höyük, showing excavation areas and inferences for structures outside of the excavated units.

or protect vessel contents, affecting overall vessel function through the comparative ease of adding, manipulating, and removing contents (Hally 1986). As is the case with many archaeological investigations, the nondiagnostic body sherds make up the largest proportion of the assemblage. Their lack of diagnostic characteristics can often lead to their being overlooked in analysis, yet their prevalence in the collections makes them a valuable resource. The base sherds are also important for inferences regarding vessel function, particularly because they reveal information about vessel stability and evidence of movement.

The Fıstıklı Höyük coarse-ware assemblage consists of five unrestricted shapes including the open- and round-walled bowls, the plate, the lid and the coarse carinated vessel. Together, these account for 46.6% of the coarse-ware sherds that could be assigned to a shape (fig. 3 and Table 2). Unrestricted-shape vessels are characterized by relatively open, unobstructed orifices lacking features such as cinched openings or necks. Restricted vessels make up the remaining 53.4% of the coarse-ware assemblage, including the straight-necked, sinuous-walled, short direct-rimmed, and hole-mouth jars (fig. 4). The uses of restricted vessels are affected by their necks or reduced orifices having the ability to pour (or conversely to spill) contents. Some of the functional uses that are affected by this restriction are the relative accessibility of a vessel's contents for addition, manipulation, and removal; the presence of a feature that aids in securing a lid or other form of covering; as well as the restriction being used as a place to grasp a vessel to lift and move it if handles are lacking.

Table 1. Analyzed sherd count from the coarse-ware assemblage at Fıstıklı Höyük, Turkey

	Total #	*Total %*
Rim-based shapes	365	15.8
Body sherds	1,821	78.6
Base shapes	130	5.6
Total	2,316	

Table 2. Table of proportions of shapes from Fıstıklı Höyük based on count.

Restricted Shapes (N=197, 53.97%)	#	%
Straight-necked jars (SNJ)	96	26.3
Sinuous-walled jars (SWJ)	61	16.7
Hole-mouth jars (HMJ)	26	7.1
Short direct-rimmed jars (SDRJ)	14	3.8

Unrestricted Shapes N=168, 46.02%)	#	%
Open bowls (OB)	119	32.6
Round-walled bowls (RWB)	40	11.0
Egg-shaped cups (EC)	6	1.6
Griddles (G)	3	1.0

Legend:
#: Number of sherds in the shaped assemblage;
%: Percentage of the shaped sherds represented with that specific shape.

The sherds from each rim-shape category were empirically tested by producing histograms of rim diameters to determine if size-classes could be made (Table 3). In most cases, there was no easy division apparent in the histograms. However, what was evident is that, while not discrete, most shape categories did in fact contain multiple size-groupings or classes. Whether or not the classes were used differently, what is intriguing is that different volume capacities or potential quantities were created within distinct shapes. This indicates that, even if the same function from multiple vessels was desired within a specific shape, some vessels were used that could hold greater quantities than others.

Analytical Methods

The visual examinations of all coarse-ware sherds were carried out using handheld 60× magnifying lenses, similar in magnification strength to the equipment

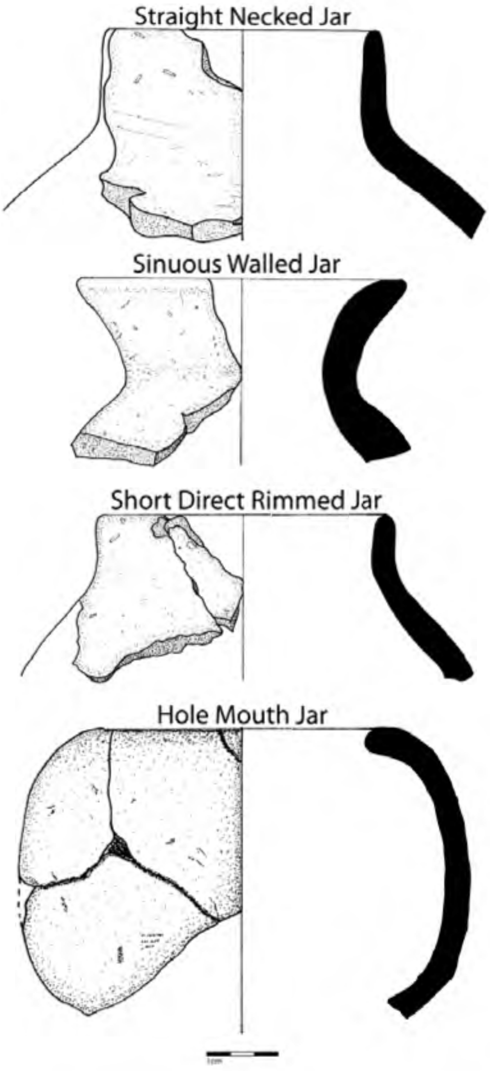

Fig. 3. Restricted vessels from Fıstıklı Höyük.

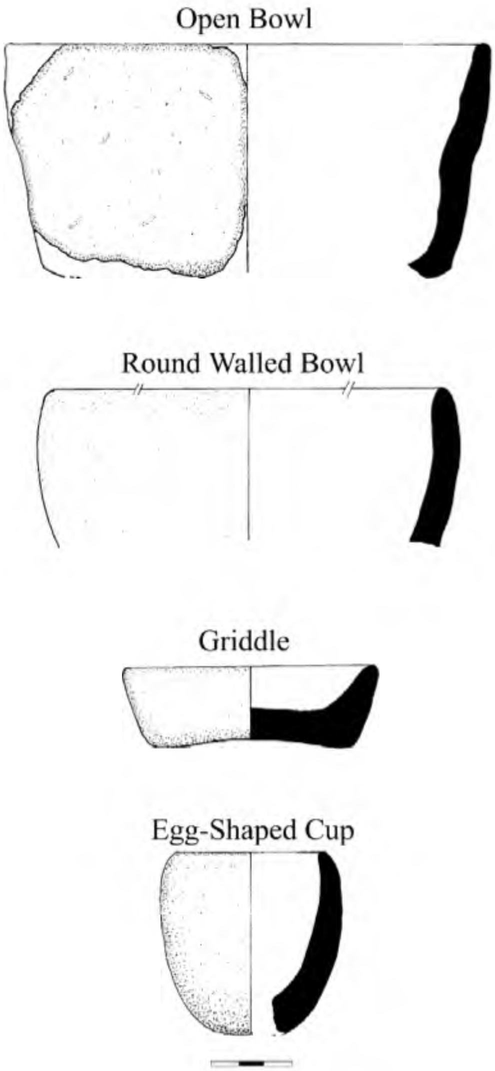

Fig. 4. Unrestricted vessels from Fıstıklı Höyük.

outlined in Skibo's (1992) use-wear study. Traces of use were examined and recorded to analyze the visible evidence of use left on the sherd surfaces through ceramic-use alteration. Traces of wear, including sooting, carbonization, scratches, gouges, abrasion, chipping, and spalling, were recorded. Each wear-marker was further subdivided into characteristics specific to its morphology. For example, scratches were recorded with information on the amount of sherd surface covered or affected by the wear, the degree of wear, the orientation of wear, location on the sherd of the wear, and the clustering of the striations.

Table 3. Size classes within the sherds assigned to shapes from Fıstıklı Höyük.

Shape	*Size Class*	*Rim Diameters*
SNJ	1	7–11 cm
	2	12–15 cm
	3	16–19 cm
	4	21–54 cm
SWJ	1	9–15 cm
	2	16–20 cm
	3	23–47 cm
HMJ	1	5–14 cm
	2	15–26 cm
SDRJ	1	11–15 cm
	2	19–27 cm
OB	1	5–10 cm
	2	11–13 cm
	3	14–16 cm
	4	17–23 cm
	5	25–47 cm
RWB	1	10–16 cm
	2	17–21 cm
	3	22–34 cm
EC	-	6 cm
G	-	10–11 cm

After the use-wear data was recorded, if a sherd retained evidence of having been used over a fire and potentially, therefore, for cooking, it was set aside for sampling. The importance of heat for examining lipid content in ceramics lies in the wicking process (Charters et al. 1993; Evershed et al. 1995; Heron et al. 1991). As a ceramic vessel is heated, its porous matrix expands, absorbing both water and food molecules from the foods being heated. Later, as the vessel cools, the ceramic matrix contracts, trapping the food molecules inside as the water evaporates from the vessel's surface. This wicking process allows the food molecules to be relatively protected within the ceramic walls even though buried for millennia and can prevent contamination from other lipids and bacteria in the surrounding soil (Charters et al. 1993; Evershed and Tuross 1996).

Each sherd chosen for lipid analysis was sampled twice. The first subsample (Sample A) was taken to remove the outer layer of the sherd's interior surface—the side that was in contact with the food. If this surface of the sherd had been contaminated by other lipids present in the soil or from handling, this contamination should be limited to this surface sample. Heron and Tuross (1996) found that, when dealing with archaeological ceramics, soil and other burial environment factors did not cause contamination of the lipids in the sherds. As an added precaution against contamination, a second subsample from the same sherd (Sample B) was taken closer to the core. Thus, if any contaminants existed, they were removed with the first sample. An attempt was made to drill not too deep into the core of a sherd, because the deeper layers may be found to be systematically lower in lipid abundances (Charters et al. 1993).

The sherd samples were taken via two methods, the first of which involved the removal of ceramic fabric with a handheld metal chisel and the second with a Taskforce® 12–volt cordless modeling drill with rechargeable battery packs fitted with Hitachi® rotary file drill bits. In the course of sampling, we found that the relatively small size of many sherds and the heavy weight of the drill itself made drill sampling difficult. Therefore, the hand-held metal chisel was our preferred sampling method. Both the drill bit and the metal awl were cleaned with sterile cotton and alcohol after each sampling activity.

Each ceramic sample was taken to a minimum weight of 1 g if possible, based on Skibo's (1992) methods. In retrospect, a greater amount of sample should have been collected to account for the large number of proxies that were analyzed in the samples. For this study, however, the average sample weight was 0.8 g for Sample A and 1.1 g for Sample B, with a combined average weight of 0.95 g. Each sample was sealed in a foil packet that was in turn sealed in airtight plastic bags and stored in a refrigerated unit until they could be removed to a laboratory in the United States. Once in the laboratory, the sherd samples were crushed with a mortar and pestle and subsequently stored in aluminum foil wrappers that were then labeled and sealed in airtight plastic bags. Carbonaceous residue (bulk organic carbon, nitrogen, and soot carbon) and isotopic analysis were conducted on sherds exported during the 2004 study season, and sherds exported during the 2006 study season were subjected to lipid residue analysis.

Bulk Carbon, Nitrogen, and Isotopic Analysis

The analysis of the sherds sampled in 2004 was based on overall nutritional values of the foods prepared within the vessels. Food by definition must have some nutritional value, which can be correlated to the amount of organic carbon and nitrogen associated with the food substance. For this reason, measurement of organic carbon (OC) abundance and nitrogen abundance (TN) can be used to provide information about the nutritional status of any residue associated with collected sherds. Organic carbon and TN abundance and isotopic ($\delta^{13}C_{OC}$, $\delta^{15}N$) analysis on the 2004 samples was conducted by acidifying sherds in 6N hydrochloric acid (HCl). Acidified sherds were dried in an oven at 75 °C for several days until their residual weight stabilized. Subsamples were then placed in pre-ashed (450 °C for 4h) silver capsules, which were crimped. Quantification of %OC, $\delta^{13}C_{OC}$, % TN, and $d^{15}N$ was done on a CHNS-O analyzer at the UC Davis Stable Isotope Facility.

Soot Carbon Analysis

A second type of analysis is that of soot carbon. In this method, there can be some confusion regarding the way in which "use-wear" is described elsewhere. Soot carbon in relation to the ground sherd samples refers to the same material that under use-wear analysis is referred to as carbonization or the burning of food contents. The different terms carry important differences for the constrasting methods of use-wear and chemical analyses. The combustion of organic matter can produce a chemical "fingerprint." The continuous heating of organic matter (OM) such as food, above and beyond ~100 °C first dehydrates and then transforms OM into an insoluble form that is resistant to oxidation and degradation (Gonzales-Perez et al. 2004; Shafizadeh 1968). At higher temperatures (~300 °C), this OM becomes charred, creating stable carbonaceous residues known as soot carbon (Czimczik et al. 2002). Soot carbon (burned food residue) was isolated in the 2004 sherds using a procedure slightly modified from that typically applied to soils and sediments (Gustafsson and Gschwend 1997: 224). Soot carbon is operationally defined as the residual carbon remaining after acidification of sherds with 6N HCl followed by thermal oxidation at 375 °C for 24 hours to remove labile carbon. A variation of this method (thermal oxidation followed by acidification) has been used to isolate soot carbon in natural soils and sediments (Gustafsson and Gschwend 1997: 224). We added the precautionary demineralization step using 6N HCl to expose occluded non-soot organic matter so that this labile organic matter would be readily thermally oxidized. The precision of this method for isolating soot carbon has been verified in the past by analyzing replicate samples for NIST Standard Reference Material 1649a (SRM 1649a, urban dust). Soot carbon was quantified in the manner noted above for OC at the UC Davis Stable Isotope Facility.

Lipid Residues

Finally, the 2006 sherd samples were analyzed for lipid residues. Carbohydrates, proteins, and lipids are the basic building-blocks of all organic matter and, therefore, food-residue analyses are based on the attempted identification of these molecules embedded within ceramics (Fankhauser 1999: 41). Analyses of residues focus on the molecules that will survive best in the archaeological environment; owing to their specific molecular structures, lipids and proteins preserve better than carbohydrates (Evershed 1992: 77; Evershed and Tuross 1996; Kimpe et al. 2004: 1503). Another advantage of lipids is that they occur in a large range of food products, such as animal adipose fats, animal dairy fats, plant oils, and natural waxes. Lipids are also easily absorbed into ceramic vessels and tend to survive normal cooking temperatures, whereas other food particles, such as proteins, degrade faster when put in contact with heat (Charters et al. 1993: 218).

The analysis of lipid residues in ceramics has received increasing attention over the last few decades. The methods adapted for this study were based on Evershed et al. (1999). In this study, lipids were isolated from 1 to 3 g of ground sherds by sequentially extracting them using a 2:1 (v:v) ratio of chloroform:methanol (10 mL) and sonicating for 45 minutes. One hundred microliters of 5α-cholestane (0.125 mg mL^{-1} in methylene chloride) was added to each sample as an internal standard. Extracts were centrifuged at 1250 rpm for 45 minutes and transferred to a rotovap flask. The extraction process was repeated three times after which the combined extracts were evaporated to dryness. The residue was reconstituted in 100% methylene chloride, filtered through precleaned (450 °C for 4 hours) glass wool and placed in precleaned glass vials. Approximately half of this total lipid extract was placed in 15 mL Pyrex conical tubes, evaporated to ~100 µL. The extract was then derivatized

Table 4. Dates and descriptions for Fıstıklı Höyük occupational phases. Dates are based on Campbell's (2007) reevaluation of Halaf chronologies.

Phase	*Beginning Date*	*Interpretation*
IV	?	Temporary encampment. Site modification only at the most basic level. People as visitors.
IIIc	5850 B.C.	Investing in the site. Construction of permanent storage not based on pottery.
IIIb	5815 B.C.	Creation of domestic space. Households with walls take shape.
IIIa	5880 B.C.	Expansion of community to its apex. Varied population and food-preparation needs.
IIIx	?	Slow abandonment and community moves elsewhere.

for 1 hour at 70 °C with ~100 µL N,O-bis(trimethylsilyl)trifluoroacetamide (BSTFA, Sigma) containing 1% trimethylchlorosilane. After derivatization, samples were evaporated again under a gentle stream of $N_2(g)$ and reconstituted in 500 µL hexane. Two µL of this final extract was injected on a Shimadzu QP2010 gas chromatograph/mass spectrometer (GC/MS) using splitless injection. The GC/MS was run with helium as a carrier gas, at a constant flow of 1 mL min^{-1}. Other GC/MS analytical conditions were as follows: injector (250 °C), oven at 60 °C, held for 2 minutes, and ramped to 320 °C at 5 °C min^{-1}. The oven was held at 320 °C for 15 minutes. For the MS, the ion source temperature was held at 200 °C and ions of masses 50 to 350 were analyzed in scan mode.

Use-Wear and Changing Site Usage

The resulting data from this multiproxy analysis, including bulk carbon, nitrogen, isotopic analysis of soot carbon, and lipid analysis, provides a unique point of entry into how households provided for themselves. As mentioned earlier, Fıstıklı Höyük was occupied for a very short time archaeologically, not exceeding 150 years, with each of the four successive occupational phases lasting only a few decades each (Table 4; Cambpell 2007: 14). Modifications to the site would have been quite rapid for the people involved.

Phase IV

At its outset, Fıstıklı Höyük was used as a temporary encampment. The visitors at this time did not modify the area to suit longer occupation beyond the construction of a narrow trough dug into the western slope to divert waters toward the Euphrates River (fig. 5; Bernbeck et al. 2003: 23). Whether people traveled to the site to pasture their flocks, harvest local foods, or perhaps for other unknown activities, there was apparently no need to modify the space more; it suited the people's needs as it was. However, channeling flood waters was not the only evidence of activity from Phase IV; the visitors also fed themselves. Archaeological remains from this phase are limited, but a number of coarse-ware sherds were recovered. Of the 69 sherds recovered, many were too small to analyze for ceramic-use alteration and therefore

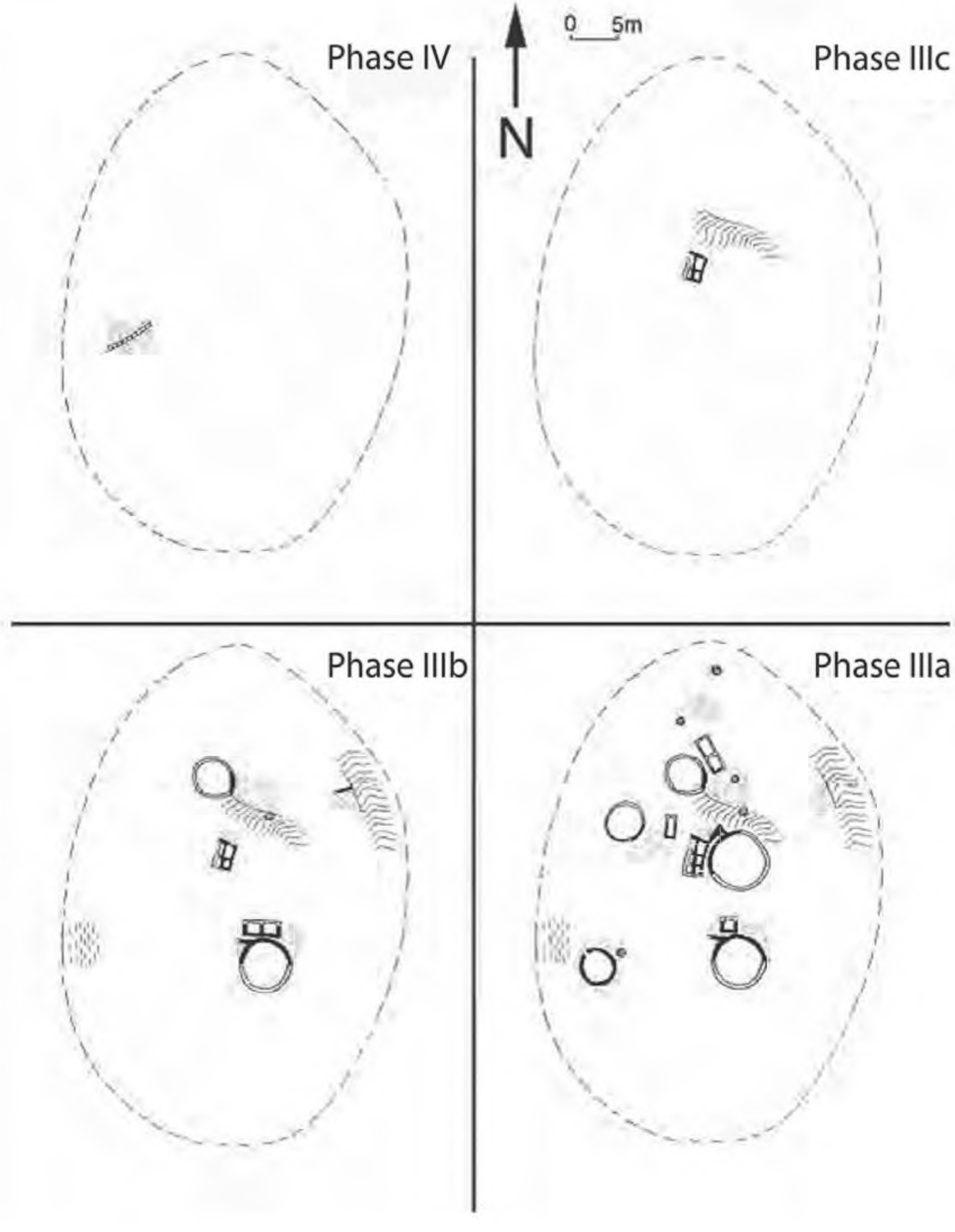

Fig. 5. Representation of the changing architecture and usage of the site as Fıstıklı Höyük changed from a temporary encampment eventually into a focal site. Used with permission from Bernbeck 2007.

Table 5. Percentages of coarse-ware sherds by categories of vessel use across the four occupational phases.

Phase	*Use*	*Total #*	*Total %*
Phase IV			
N=69	Heating/Cooking	29	42.0
	Mobile Container	9	13.0
	Stationary Storage	31	44.9
Phase IIIC			
N=172	Heating/Cooking	68	39.5
	Mobile Container	43	25.0
	Stationary Storage	61	35.5
Phase IIIB			
N=87	Heating/Cooking	15	17.2
	Mobile Container	17	19.5
	Stationary Storage	55	63.2
Phase IIIA			
N=1943	Heating/Cooking	501	25.8
	Mobile Container	391	20.1
	Stationary Storage	1,054	54.2

were recorded for primary tempering material and other standard dimensional measurements alone. Only 24.% (N=17) of the Phase IV sherds could be identified as belonging to a specific vessel shape.

A detailed examination of the wear on the Phase IV coarse ware shows a range of variation in all three main functions of food preparation: heating/cooking, mobile container, and stationary storage (Table 5). The heating/cooking activities were carried out primarily with restricted forms, such as the straight-necked and sinuous-walled jars. These sherds provide little evidence for vessel movement and therefore may have primarily been used in and around a fire without being transported a great deal. Soot and carbonization evidence suggests that the vessels were used over smoky fires, and the foods were consistently burned within them. It is difficult to gauge the quantity of the foods prepared, but the cooking vessels themselves were relatively small, with the largest being the small, straight-necked jars. If the encampment was occupied by only a handful of people, large quantities of food would not have been required.

Evidence of containers used for moving foodstuffs around the site or to transport goods elsewhere is found primarily on the remains of the larger sherds, namely the large straight-necked jars and open bowls. Most of the wear on these sherds was to the exterior surface from vessel movement, but there was some minor wear from content manipulation. Stationary storage activities were only carried out using the restricted shapes. These smaller-orificed vessels often show evidence of having been covered with hard lids and were also capped with a malleable cover that, when removed, left traces of wear behind.

The use-wear evidence from Phase IV suggests that the transport of containers, unless well protected, was secondary to the desire for stationary storage. Though the modification of the site indicates only temporary occupation, perhaps this was simply ephemeral occupation. It is possible that if there was more focus on the preparation and storage of materials and foodstuffs from the Phase IV encampment to another site, then the vessels used for this transport (if in fact they were made out of ceramics) may have been removed from the site and not brought back.

Phase IIIc

In Phase IIIc, there is a distinct shift in site usage. Potentially serving a similar function of flood-water control as did the previous water channel, a large bell-shaped earthwork was constructed from the center of the mound, down and to the southeast (Bernbeck et al. 2003; Pollock et al. 2001). Following this construction, a cell-plan storage unit was built. This unit was built on top of two previous small clay- and plaster-lined pits that may have been used for storage purposes (Bernbeck 2007; Bernbeck et al. 2003: 23). The storage unit was built as two 1 m^2 pisé cells, which could have been filled, capped with pisé, opened to remove the contents, with the cycle then repeated again. If any living structures existed at this time, they are too ephemeral to have been recognized in the archaeological record. However, these storage and landscape modifications signify an active desire to shape this low-lying space into a "place" (deCerteau 1984). Investment was being made in Fıstıklı Höyük beyond that of a temporary encampment.

Coinciding with the architectural modifications of Phase IIIc are changes in the coarse-ware assemblage. Variation in vessel size and shape increase dramatically, signifying an increase in both the variety and amount of foods that could be prepared. Differences in vessel size relate directly to the amount of food that could be prepared at any time. Smaller vessels allow for subsequently smaller quantities of food to be prepared, for example, but would not be appropriate for the preparation of a meal to feed more than one or two people. The larger a vessel, the more food can be prepared, but the heavier and potentially more unwieldy it will become when filled and hot. How much a vessel will hold, the ability to add, manipulate, and remove contents, as well as the relative ease of picking up and moving a vessel to and from a fire, are just a few of the considerations that affect the choice of which vessel to use for a task. These deliberations may not be conscious thought for the practiced cook who is simply fulfilling a task that has been carried out countless times, but these are the variations that are taught to younger generations.

Heating/cooking activities in Phase IIIc cover a wide range of vessel shapes, sizes, and heat levels, which often were chosen from the unrestricted or more open shapes. Both the round-walled and open bowls retained evidence of low levels of heat but were used with hard lids. These vessels could have been covered and put to the side of the fire to cook slowly while other activities were carried out. In Brumfiel's (1991) account of Aztec women's cooking, this type of meal allowed women to leave the meal simmering in the background while other activities were carried out. This form of low-temperature, slow cooking requires time to prepare the meal but permits longer unattended cooking time. There were also a number of high, intense-heat activities during this phase. In some cases, multiple size classes of the same shape show similar patterns of use but are separated across differences in size class. This suggests that in some preparations it is the desired quantity of the final product that drives the selection of a vessel for use.

The mobile containers from Phase IIIc tend to have moderate levels of exterior wear, with less evidence of content manipulation. The large straight-necked jars showed evidence of greater exterior than interior wear but were used with hard lids. Wear around their rims suggests that they could have been capped with clay to close and protect the contents. The movements required of these vessels require a good deal of surface strength, and it is not surprising that the combination-tempered wares make up 54.5% of the functional category.

The stationary storage vessels show little variation within this functional category. Evidence of interior wear is variable across the shapes and sizes, suggesting that some shapes may have been better suited for certain tasks and activities. Of interest here is that while the mobile storage vessels were often the larger size class, this is not the case with stationary storage vessels. It is possible that with the construction of the cell-plan building storage unit, larger vessels were no longer required for storage. The largest stationary storage vessel from this phase is the medium straight-necked jars. As seen with the heating/cooking sherds, the stationary storage sherds are generally comprised of vegetal-temper. There is little wear evidence from whatever was stored within the vessels, suggesting that either there was careful access to the contents or that the contents were not of a type that would leave evidence of wear.

An interesting vessel type is the miniature open bowl, a small, cup-like shape that could fit in one hand. These vessels were often worn around their exterior rims and upper bodies, specifically with substantial vertical scratching and abrasive wear. This indicates that the vessels were used in a movement that was vertical from the rim toward the base. If these vessels were used as scoops to remove contents from a vessel or receptacle, this type of wear pattern could have resulted. Particularly if the storage and usage of stored foods or other materials was an integral function of food preparation, scooping vessels would have been a valuable tool, aiding in the movement and usage of foodstuffs such as grains usually stored in larger vessels. Other forms of utensils did not survive in the archaeological record at Fıstıklı Höyük, leaving only suppositions that implements of wood and bone were likely used to stir, add, remove, and otherwise manipulate foods during preparation as well as consumption. With the great focus on storage, both in mobile and stationary containers, scoops to add and remove material could be an important tool type. These hand-held miniature vessels appear to have met that requirement.

Phase IIIb

It is only with Phase IIIb that we see the beginning of a more permanent habitation at Fıstıklı Höyük, with the construction of domestic structures and multiple storage units. The previously existing storage unit at the center of the mound was expanded, and the first living structure was built to the southeast, with a storage unit built next to it. This structure was also excavated to nearly half of its interior floor plan, allowing for an inner view of domestic space. Two hearths were constructed within, both of which were surrounded by raised barriers of clay to protect or shield the heaths. Numerous work surfaces were identified inside the structure, one of which was found with a series of basalt fist-grinders on its surface, suggesting that grinding activities were carried out (at least in part) inside as well. Where there had been more ephemeral traces of food preparation procedures in the two previous phases, now there is evidence of these activities being carried out both outside and inside the constructed domestic space. Hearths were built into both of the standing earthwork constructions, as well as created inside *tholoi*, as visible in Tholos IV. In all, two *tholoi*, a storage unit, and a second earthwork were built during this phase of occupation.

Sherds affected by heating and cooking make up the smallest percentage (17.2%) of the Phase IIIb assemblage but exhibit a variety of vessel shapes. Straight-necked jar, sinuous-walled jars, round-walled bowls, open bowls, and short direct-rimmed jars all are represented in these heating activities. Yet, while there are a variety of shapes utilized, the sizes of the vessels remain relatively small. The miniature straight-necked jars could hold only a small quantity of food, but the contents are also often heated and scorched. The sinuous-walled jars and open bowls are both small in size, and although there is variability in the amount of sooting, carbonization is generally high, indicating high-temperature cooking and recurrent food burning in both vessel shapes. The sinuous-walled jars are used without hard lids, potentially relying on their restricted orifices to protect the food to a limited extent and to allow content manipulation, while the open-bowl vessels are generally covered with hard lids. Overall, high temperatures tend to be used for the Phase IIIb heating/cooking activities. The body sherds from Phase IIIb suggest lower cooking temperatures for the vessels tempered with vegetal or combination materials (87.5%), with the remaining mineral-tempered sherds resulting from vessels used over high levels of heat. No sherds affected by heating/cooking were recovered for this phase.

Shaped sherds used for mobile containers in Phase IIIb are represented solely by the round-walled bowls. The miniature vessel sherds exhibit wear, with vertical striations around the rim signifying that they were also used as scoops. The medium-sized vessels instead may have been capped with a clay sealant, or at minimum were covered with hard lids. These vessels could have been used for transport of materials away from Fıstıklı Höyük.

Often, it is assumed that a stationary storage vessel is large and physically stable. However, this is not always the case, because smaller vessels, once filled, may also remain more or less in the same place. The round-walled and open bowl and short direct-rimmed jars all showed evidence of stationary storage. Although smaller sizes are found in all three shapes, it is the open bowl that also exists as a large, stationary storage vessel. Most of these vessels have negligible use wear, with some hard lid use or potential capping. Materials that were sealed could have been placed in the mobile containers or in the two on-site storage units.

What are lacking from Phase IIIb are large storage vessels. Only one large storage vessel was recorded for this phase, a large open bowl. This lack of evidence may represent the existence of different storage strategies made possible by both the *tholoi* and cell-plan buildings. With the usage of the two cell-plan buildings and potentially other forms of storage that were not preserved in the archaeological record (i.e., basketry or leather bags), large storage jars are likely not present because they were not necessary. This development coincides with the movement from more closed, protected vessels into more open, easily accessible ones. Food preparation was being conducted in both exterior, public spaces and interior, private ones as well.

Although Phase IIIb is both a time of incredible growth and construction at Fıstıklı Höyük, it is also an enigmatic time in relation to the coarse-ware assemblage.

With the increase in more permanent structures and storage, a continued increase in vessel size to produce greater quantities of food could also be expected. Instead, there is an emphasis on storage using smaller vessels, the movement of foods with larger vessels, and an overall decline in heated preparations. This time of growth for the community also could have been a time of shifting practices of food preparation—different quantities, different methods of preparation and of storage. The emphasis on storage could also signify that, with a larger population, fewer resources were being transported away from the site but instead were being being brought in.

Phase IIIa

The beginning of Phase IIIa occupation at Fıstıklı Höyük is marked by renewed construction. The largest structure at the site was constructed near the center of the mound. The interior space of this structure was divided by a low partition wall and a hearth at its center. The presence of single or multiple hearths within Tholos I and IV suggest there may have also been interior hearths in the *tholoi* that were not excavated to their interiors. Three other *tholoi* were also built during this phase, expanding the area of the mound that was inhabited. One of these *tholoi*, Tholos II, was close to the western midden that was capped with ash, pisé, and other materials, essentially sealing off the unpleasant aspects of food preparation trash so near to a domestic structure. Intense outside food preparation activities were practiced in a number of areas around the settlement, but the northern portion of the mound became a focal point for exterior activity. Numerous ovens were also constructed around the site, often near *tholoi*. By the apex of Phase IIIa, the community had created five living structures, six storage units, and five ovens, along with multiple interior and exterior hearths and other work areas.

The increase in living structures over the course of the occupation of Fıstıklı Höyük implies an increase in variation within community demographics. The establishment of residential units could accommodate an expansion in the age ranges of the population, incorporating both the very young and the very old who would not necessarily be able to travel with a more mobile group. Concurrent with this population change would have been a change in food preparation to support a population including the very young and the very old. Different-aged individuals can require different textures of food, thus requiring multiple preparations. Some of the changes that could be expected would be a greater variety in vessel size, allowing for different quantities, vessel shapes to allow for different types of preparations, and an increase in types of food preparation installations, such as hearths, ovens, and ground-stone tools.

The expansion in assemblage composition provides evidence that such preparations were possible. Heating/cooking activities make up 25.8% of the functional wear visible on the Phase IIIa sherds, with a wide range of shapes and sizes utilized. The sheer amount of variation signifies that there was a need for varying quantities, as well as different types, of food. Without this preference for specific types (if not shapes) of tools for cooking and other forms of preparation, a much simpler array of vessels would have sufficed. Through the use-wear analysis, three categories of heating/cooking activities ranging from low, to moderate, to high heat were determined. The ability to control the temperature of what is being cooked or heated is often the difference between burning and not burning food. The contact of heat to food can be mitigated by thickness of the vessel walls, distance from the heat source, and amount of liquid within the vessel. The lowest temperatures used were often with a smaller-sized vessel, namely, the small-to-medium-sized straight-necked jar, round-walled bowls, and short direct-rimmed jars, along with the small short direct rimmed-jars and the griddle. These vessels were used near low-heat fires or even placed in the ashes to cook/heat their contents slowly on low heat. Only the small sinuous-walled jars evidenced use with a hard lid, but the other vessels could have been covered with a material that was not preserved in the archaeological record or that did not leave traces of wear.

Moderate levels of heat, often resulting in variable coverage of soot and/or carbon on the sherds would have required the vessels to have been positioned closer to the fire or other heat source. A range of size-classes was used for these functions, from the miniature to the medium-sized round-walled bowls, the medium-sized sinuous-walled jars and round-walled bowls, and the largest open bowls. These vessels could have been moved from high heat fires to initially raise the temperature and then have been pulled aside to continue cooking but at a lower temperature. Hard lids were often used—likely both to retain heat within the vessels as well as to protect the contents from fire detritus falling in, particularly if they were to be left near the fire for long periods of time. Both low and moderate heat levels could be useful for creating slow-cooking stews and other wet applications utilizing tougher foodstuffs that take time to break down and soften, such as some cuts of meat and tubers.

It is with the highest levels of intense heat that the greatest amount of evidence was found for Phase IIIa heating/cooking sherds. These sherds all retained high levels of both exterior fire-carbon and interior food-carbonization, signifying that they were used over high levels of heat and that their contents were able to burn. However, this does not mean that the vessels were left over high levels of heat throughout their usage. Initial intense heat could be used to heat a vessel's contents and then, like the moderate heat examples, a vessel could be set to the side of the fire or into hot coals. These vessels show very wide variation in the presence or absence of lids or covers. Many retained high levels of wear from hard lid use, and others did not. Some of these vessels, like the large straight-necked jars, medium sinuous-walled jars, medium open bowls, and medium hole-mouth jars, may have been used primarily for open cooking activities, in which the vessel is left uncovered, steam is allowed to escape, and vessel contents can easily be accessed (depending on relative orifice size and shape) for content manipulation, such as stirring. Other vessels, such as miniature straight-necked and sinuous-walled jars, large open bowls, and large hole-mouth jars, were used with lids. The evidence of heating/cooking and use wear for the large open bowl and both sizes of hole-mouth jars suggests that these were preferred cooking vessels.

Based on preliminary data from a study of sooting patterns from differently fueled fires, wood-burning fires burn hotter than dung-burning fires, as well as leaving intense patterns of sooting after only a few minutes over the flames. Dung-burning fires can also leave intense traces of sooting in a short amount of time but also burn longer than a wood-fire, requiring less tending and adding on of fuel. Although it is unlikely that only certain types of vessels were used over specific types of fires, it is possible that specific heating methods were preferred for different preparations. Therefore, if a certain cooked food is best when cooked over a lower flame for longer burning, the preferred shapes for that preparation could retain different patterns of heat than vessels used for other types of foods.

Sherds from vessels used as mobile containers made up the smallest percentage (20.1%) of the Phase IIIa assemblage. These sherds often have greater levels of exterior to interior wear but, most importantly, provide evidence for being moved around. The degree of movement could have occurred simply from moving a vessel within the settlement itself or from taking it farther afield. Mobile storage containers were often used with lids and sometimes retained wear that suggests a more secure protection than a lid that could slide off or otherwise be easily removed. Mobile containers with a raised or everted rim, such as the large straight-necked jar, retained wear suggestive of capping. In this form of vessel closure, the orifice could be covered with a lid (hard or soft) and then capped with clay as a sealant. These vessels could be used for longer-term storage or transport because they provided a higher level of content protection. The removal of this clay cap, or even a secured textile, would result in higher levels of damage to a vessel's rim and, potentially, the neck area. Vessel types that retained evidence of hard lid use that may or may not have utilized capping include the medium round-walled bowls and the medium-to-large open bowl. A number of ceramic scoops were recovered from this phase as well.

Stationary storage activities make up a bulk of the uses for the Phase IIIa community. Three types of stationary storage were distinguished during this phase of community growth: those capped for longer-term storage, those worn from liquid storage, and those used for general storage. The capped vessels retained negligible evidence of being moved, with the greatest source of wear coming from the active protection of their contents through hard lids or capping. The primary vessels used for these activities include the miniature and small straight-necked and sinuous-walled jars. These smaller-orificed and often smaller-bodied vessels would have held smaller quantities of material but were the apparent choice for their contents to be more securely protected for future use.

Use wear from the storage of wet and potentially acidic contents was found in a number of the sherds belonging to stationary storage vessels. This type of wear could result from water storage in general, leaching/soaking foods, or fermentation. As a vessel's surfaces become saturated with liquid, they become weaker. Even a water storage vessel can be more prone to wear than a similarly sized vessel holding dried grain. These sherds lacked evidence of heating but were marked with high levels of surface pits, particularly on their interior surfaces. If the vessels' interiors were weakened from prolonged exposure to water or other acidic liquids, this could predispose them to pitting and other forms of wear through utensil impact and content manipulation. The primary shapes exhibiting this type of wear include the medium straight-necked jar, the medium hole-mouth jar, and the small short direct-rimmed jar.

Finally, there was a subset of stationary storage sherds that did not retain much evidence of use wear at all. These vessels could have been filled and then left alone for longer-term storage and thus did not retain use wear or could have been filled with contents that, even if manipulated, may not leave many traces of wear behind. Water storage jars are one example of a vessel that may not leave behind evidence of content manipulation. The vessels used for these activities tend to be larger but not necessarily the largest of the assemblage. The shapes and sizes utilized for these activities include medium sinuous-walled jars, the medium and large round-walled bowls, the small, medium, and very large open bowls, the medium hole-mouth jars, and the medium short direct-rimmed jars.

These traces of heating/cooking vessels as well as the different types of use wear evident on the Fıstıklı Höyük coarse-ware assemblage are based on visible traces of use and would therefore be incomplete without the chemical analyses carried out on the samples described previously.

Bulk and Soot Carbon Results

The abundance and isotopic signatures of organic matter have been used to reconstruct diets across times ranging from recent (Jahren and Kraft 2008: 2057) to the geological past (e.g., Freeman and Colarusso 2001: 1157). Similarly, soot carbon abundance and its carbon isotopic signature can be used to decipher the type of material (i.e., fuel) that was burned within the vessels (Goldberg 1985: 203).We used organic carbon, soot carbon, and nitrogen abundance (herein referred to as %OC, %sootC, and %N) and also the ratio of $^{13}C/^{12}C$ isotopes in organic carbon (O'Leary 1988) and soot carbon and the ratio of $^{15}N/^{14}N$ in the residual organic matter in each sherd (respectively referred to as $\delta^{13}C_{OC}$, $\delta^{13}C_{soot}$, and $\delta^{15}N_{TN}$) to answer two questions: were the vessel sherds recovered at Fıstıklı Höyük in 2004 used for cooking, and if so, were there specific locations on vessels that yielded more reliable signals of food residue?

Organic carbon abundance ranged from 0.11% to 2.6% per dry weight of sherd. While these values are not unequivocally representative of food substances, the average $\delta^{13}C_{OC}$ across all sherds tested is largely representative of material derived from C–3 plant-derived organic matter, consisting of trees and other non-grassy vegetation (fig. 6). While it cannot be ruled out that residual organic matter in soils may have contributed to the organic carbon signatures on these sherds, nitrogen abundances are high enough (0.01–0.18%) that it is reasonable to assume organic matter from food was associated with the sherds tested. Soot carbon abundance in the sherds tested ranged from 0.08–1.98% of the dry weight of each sherd. These abundances are indeed significant and suggest that sherds were likely used for cooking. This corroborates visual observations of interior burning in the ceramic vessels throughout all phases of occupation at Fıstıklı Höyük. Furthermore, correlation coefficients are high between %OC and % soot carbon ($r^2 = 0.76$) and $\delta^{13}C_{OC}$ and $\delta^{13}C_{soot}$ ($r^2 = 0.95$). Such a high degree of correlation between organic carbon and soot carbon abundance and isotopic signature suggests that soot isolated from these sherds was the result of pyrogenic processes.

Lipid Residues Results

Lipid residue analysis consisted of quantifying n-alkanes and carboxylic acids isolated in sherds collected from the 2006 study season. In general, both of these lipid subgroups were abundant in all sherds tested. This suggests that the lipids in sherds are stable and may be representative of original food substances cooked in these sherds. Detectable fatty acids consisted of both short-chain (C8–octanoic acid) as well as long-chain (C24 tetracosane) compounds. Although two sherd samples

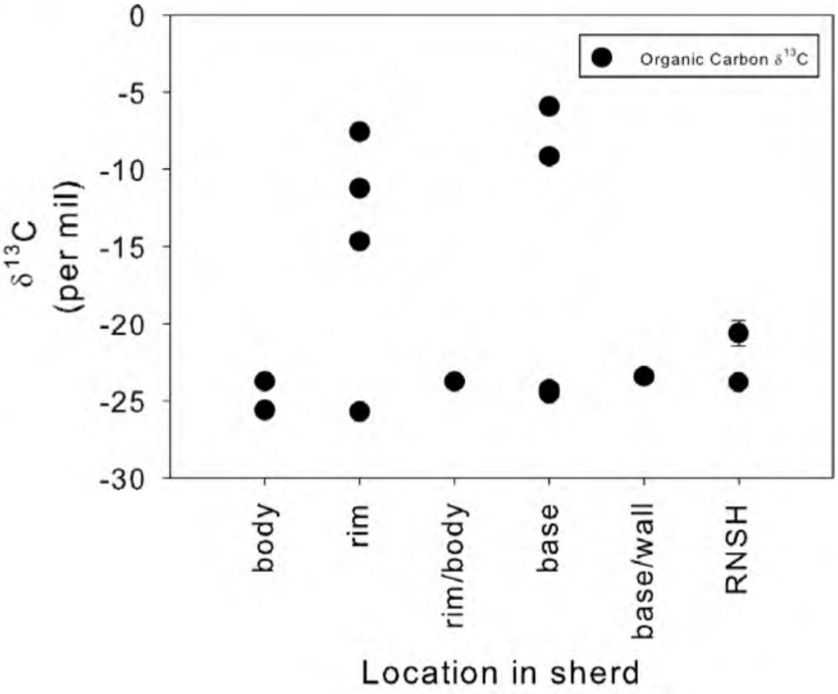

Fig. 6. The isotopic ratio of 13C/12C in residual organic matter associated with each sherd expressed as $d^{13}C$ using the conventional notation as discussed in O'Leary (1988).

contained traces of propenoic acid, a compound found in sunscreen, and two contained plasticizer contamination, no lipids were detected in laboratory blanks. Though gloves were worn when handling the sherds for the collection of the samples for lipid analysis, the sherds had initially been touched by many people, including excavators, sherd washers, and sorters, as well as then being handled again by our team (Hopwood) during the visual use wear analysis. Because the contamination due to sunscreen was restricted to two sherd samples and the remaining sherds did not appear contaminated with propenoic acid, lipid residue was generally considered to be representative of ancient Fıstıklı Höyük food storage through various phases of the evolution of the settlement.

There was no systematic difference in lipid abundance or compound class that could be attributed to differences in each phase of Fıstıklı Höyük settlements (fig. 7). However, several of the compounds are broadly representative of lipids derived from both animal and vegetable matter. For example, hexadecanoic acid (otherwise known as palmitic acid) is a common saturated fatty acid found in animals and plants: butter, cheese, milk, and meat all contain palmitic acid. Similarly, octadecanoic acid (i.e., stearic acid) is derived from the high-temperature heating of animal fat and can be found in many animal fat extracts.

Though the soot-carbon and lipid analyses cannot be used to differentiate between food preparation activities or consumption across the Fıstıklı Höyük occupational phases, they can highlight some interesting hypotheses about what was being cooked by the community, particularly in Phase IIIa. The soot-carbon analyses suggests that the evidence of fire-carbon described in the use-wear analysis was in fact from cooking activities rather than other forms of burning. Furthermore, the carbon signatures represent primarily C3 plants rather than C4 in the carbonized materials.

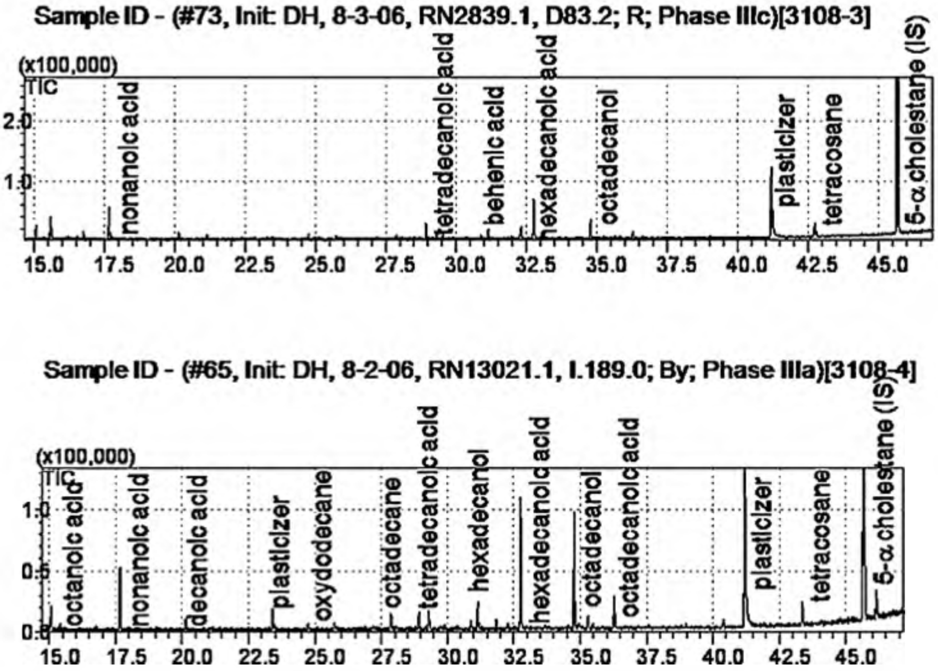

Fig. 7. Total ion chromatogram of lipid extracts from selected sherds emphasizing stability of n-alkane and carboxylic acid lipid classes in sherd samples from Phase IIIc and IIIa. Laboratory blanks did not contain any lipids other than the 5α-cholestane internal standard.

While C3, or broad-leafed, plants make up a majority of plant species, the C4 plants are those that represent plants such as grains. Therefore, the dearth of grain evidence in the cooking vessels suggests that the grain present at the site was not being prepared in the ceramic vessels, or at least not in large quantities. Grain could have been ground and used for bread, parched in the ovens, or potentially fermented in the stationary storage vessels (Atalay and Hastorf 2006; Clayton 2004). This would not necessarily have resulted in beer as we know it today but could have been used in bread-making or even in mildly alcoholic beverages (Arthur 2003).

While the lipid analysis cannot at this stage imply specific types of foods that were prepared in the coarse-ware vessels, the presence of lipids derived from animal proteins were detected. Palmitic acid, as stated above, can be found in many animal food sources including meat, fats, and dairy products but can also be found in oils from people's hands. However, the presence of octadecanoic or stearic acid results from heating animal fats to high temperatures. Two potential uses of animal fats that could have resulted in these signatures is the cooking of animal fats in the vessels or the use of tallow as an interior sealant. The preparation of animal fat or bone grease could have been carried out in the vessels (Church and Lyman 2003; Leechman 1951; Lupo and Schmitt 1997; Outram 2001; Saint-Germain 1997). The resultant fat could have been used as a flavor enhancer with many types of foods, much as different fats are used for flavoring in cooking today, such as olive oil, butter, and bacon fat.

The use of tallow as a ceramic sealant could also have been of great use to the Fıstıklı Höyük community. A majority of the coarse-ware vessels were created with heavily if not predominately vegetal-tempered wares. The vegetal impressions remaining after the temper burned out would have resulted in highly permeable and porous vessels. This porosity can be beneficial for some uses, such as water storage in which the evaporation from a vessel's surface both cools the water itself and affects its taste (Henrickson and McDonald 1983: 633) but can be problematic if the goal is to retain liquid within the vessel. While burnishing a vessel's exterior can help prevent exterior evaporation, interior sealant can help reduce the amount of liquid absorbed into a vessel's walls, further reducing liquid loss and thermal stress from the escaping steam from a cooking vessel. In Turkey, the practice of seasoning pottery by first filling them with bones and water, then heating them to high temperatures and cooking them for long periods of time has also been observed by Hopwood.

Conclusion

By the end of Phase IIIa, community members had begun to move again, having selected another site unknown to us. The gradual abandonment began with the reduction in size of the storage units and then the desertion of *tholoi* (Bernbeck et al. 2003; Pollock et al. 2001). We do not know where the vessels were necessarily stored when in use either within the *tholoi* or outside in the ovens and hearths, because both domestic and work spaces were emptied as the inhabitants moved on. This out-migration affected the settlement slowly, moving up from the south until the northernmost section at the height of the mound was the last occupied. Phase IIIx represents the final Halaf Period occupation at the site and is found only in the excavation of an earthwork in which a carbon sample indicates that a small hearth and windbreak were established on the site sometime after its abandonment (Bernbeck et al. 2003; Pollock et al. 2001).

Throughout Fıstıklı Höyük's Halaf Period occupation, the various households present are represented by food preparation features and assemblages. Beginning with the initial ephemeral occupation and moving forward in time to the larger community, this study explored one function of households through the activities and actions that went into their provisioning. As the people's relationship with the site changed from tent encampment to storage facility to settlement, much more changed than simply the architecture. The ways in which households fed themselves changed from a focus on the potentially transportable through greater and greater variety of vessel volume and array of uses to the immobile. With the usage of larger vessels over time, household focus may have shifted from supporting just the immediate members to more communal food-preparation practices. Household space changed from an ephemeral primarily storage-based entity to places where communal food preparation activities took place. The use of the coarse-ware assemblage therefore represents changes in the function of the larger community as it shifted with the ebb and flow of the population and their needs of the time.

The soot-carbon and lipid analyses also allow for a more-nuanced understanding of meal preparation and cooking, particularly in Phase IIIa. Although specific combinations of foods and identification of the ingredients used cannot be determined, some level of preference is apparent. Discussions of early agriculture and farming villages often assume that grain was consumed in the form of breads or porridges, but reach no further conclusions. Within the Fıstıklı Höyük cooking vessels, we have evidence of vegetable foods being prepared, but not grains. Clayton (2004) suggests that the ovens were used to parch and malt grain, but according to the vessels analyzed for lipids thus far, grains were not habitually being prepared in heated ceramic vessels. Furthermore, the presence of stearic acid in cooking pots indicates some form of animal-fat processing. Be this through bone-grease production, the use of animal fat to seal the interior of a vessel against permeability, the use of animal fat as a flavoring agent, or as a cooking medium, there is evidence of the processing and potential preparation of animal products for consumption. More faunal research into the types of foods available to the community is necessary in order to reach any additional conclusions.

The changes in architecture and site usage are simply two lines of evidence among many for the changing function of the community at Fıstıklı Höyük. Another line of evidence is the composition of the coarse-ware assemblage. In this essay, each occupational phase was explored through linking the visible changes in site modification to changes in the coarse-ware assemblage. Both of these lines of evidence—active shaping of space and the preparation of foods—are visible products of functional and conceptual changes of the community as a whole. Decisions people make about where they will live, if they want to stay as a part of this community, or if they want to move on all factor into how daily life is carried out and thus into quotidian practices such as the preparing of meals.

The shifting patterns of food preparation activities at Fıstıklı Höyük over the course of its occupation represent larger changes in the community. The needs and expectations of a small group not planning on necessarily staying at this spot for long will be dramatically different from a small community of various households, ages, and community roles. Therefore, the patterns visible through the remains of a community providing for and feeding its members will be largely unique to that community alone, much as within a culture today there can be characteristic food practices that are nonetheless often carried out differently in different regions and even in different households.

These practices go beyond mere providing, but were in fact ways that households and the greater community were produced and reproduced on a daily basis. Based on Campbell's (2007) reorganized Halaf chronologies, the time between occupational phases at Fıstıklı Höyük could have been as short as a few decades, a blink of the eye in archaeological time. Whether the changes visible through their material remains are snippets of a larger pattern of mobility, such as the multisited community model suggested by Bernbeck (2007), or represent a period of radical change and adaptation for the community at Fıstıklı Höyük is uncertain. What is clear is that the activities that went into the meals created by the households at this site move beyond simply eating to survive; they were designed to hold the group together.

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Integrating Household Archaeology and Archaeobotany:

A Case Study from Ubaid Kenan Tepe, Southeastern Anatolia

Philip Graham and Alexia Smith

Introduction

Archaeobotany first developed as a distinct discipline in the 1960s following the advent of flotation. Since then, much of the archaeobotanical research conducted in the Old World has focused on crop production and subsistence, addressing questions of what people ate and how they acquired or produced food. In recent years, there has been an increasing shift toward the study of households and household economics. Household archaeology and archaeobotany are natural complements to one another and allow for insights into how food is processed and managed at the household level. In this paper, we evaluate the utility of combining archaeobotany with household archaeology to address both functional and social questions, such as plant use and processing at the household level and the presence or absence of communal agricultural production. Activity-area analysis, which examines the locations of and relationships between loci where particular activities occurred, is a particularly useful concept because it provides a framework for investigating household agricultural practice. We discuss ways to approach activity-area analysis using archaeobotanical data and conclude by applying this approach to eight samples recovered from a burned Ubaid Period household (dating to ca. 4700 B.C.E. [Parker, this volume]) at Kenan Tepe, a multiperiod site in Southeastern Turkey.

Household Archaeology and Archaeobotany

Household archaeology emerged in response to a long-standing tradition within archaeology that concentrated heavily on palaces, temples, and elite classes and refocused attention on the lives of average citizens. The approach combines the study of both the dwelling (the physical structure in which people live) and the household that Wilk and Rathje (1982: 618) define as "the most common social component of subsistence." A household consists of the dwelling, members of the household, their possessions, as well as activity areas associated with the dwelling and its inhabitants. Because one of the main focal areas of household archaeology is subsistence, archaeobotany and household archaeology are natural complements to one another. Ethnographic research shows that most inhabitants of agricultural villages are involved in the growing and processing of plants, even if it is for only part of the year (Kramer 1978). The same was likely true at Kenan Tepe, where food production and processing undoubtedly played a major role in the daily lives of average people. The importance of these activities to the maintenance and organization of a village underscores the advantages of integrating archaeobotany with household archaeology.

To date, many household archaeology studies have struggled to account for abandonment practices. Typically, when a group abandons a dwelling, human agency affects what is left behind and what is carried away (Lamotta and Schiffer 1999; Nelson and Hegmon 2001; Schiffer 1976, 1983, 1985, 1987; Stevenson 1982). The extent to which objects are removed will vary, depending upon the reasons for abandonment. Planned abandonment resulting from an aging structure, for example, would allow ample time for desired items and commodities to be removed, whereas an unplanned abandonment caused by either an accidental or violent destruction of a dwelling would result in a different pattern. Clearly, it is possible for people to remove objects after a household has been destroyed, further complicating the issue, but plant remains are less likely to be retrieved than portable objects with a higher economic value. This is particularly true in instances where a household was abandoned due to a catastrophic fire, as is the case for one of the structures at Kenan Tepe examined here.

The most common way for archaeobotanical remains to be preserved in the Near East is through charring. When seeds are exposed to fire, they can become carbonized and rendered impervious to microbial and fungal decay. Since charred botanical remains are inedible, they are often considered trash. While they may be dumped into middens on a regular basis when a household is occupied, following an abandonment caused by fire, charred botanicals are often left in situ. During a planned abandonment, stored plants would likely be moved, but in the case of unplanned abandonment due to fire, it is unlikely that there would be much impetus to clean out any charred botanical "trash" before leaving. Consequently, while issues of preservation and interpretation certainly exist, plant remains do not suffer from abandonment biases to the same extent that other artifact types do. For this reason, archaeobotanical remains are particularly useful in identifying and defining activity areas, thereby allowing for a fuller understanding of the organization of food production, processing, and preparation in and around the house.

Activity-Area Analysis

On a daily basis, numerous activities would have been carried out by the inhabitants of a dwelling. Some of these activities (such as breastfeeding a child or getting dressed), while mundane and routinely practiced, leave no tangible traces and remain invisible to the archaeologist. Other commonplace activities (such as the creation of stone tools, crop processing, food preparation, cooking, and the storage of comestibles) that leave a material record can be recognized and the spatial limit of the activity estimated. Numerous activities can take place in any given location and, as such, activity areas are defined as discrete locations where one or multiple tasks associated with a given household take place (Flannery and Winter 1976; Kent 1984;

Winter 1976). Activity areas may be located within or outside of the dwelling and can be recognized by multiple in situ artifacts, including architectural elements that are involved in the completion of a task. By examining the relationship between different activity areas in and around the dwelling, as well as the relationships between different household units, activity-area analysis can yield rich insights into household function and economy. Previous studies have demonstrated the utility of activity-area analysis to make inferences about the social and economic relationships within a household largely by investigating the location and placement of various architectural units such as windows or walls for increased privacy, the development of internal storage structures for food or other commodities, and the locations of artifacts inside and around the house (Byrd 1994, 2000; Hartung 2003; Kent 1984, 1990; Kuijt 2000; Lawrence and Low 1990). Very few studies, however, have integrated archaeobotany, household archaeology, and activity-area analysis. While archaeobotanists routinely consider the archaeological context or origin of a sample when interpreting the remains, activity-area analysis goes beyond the normal consideration of context since it relies on the presence of multiple types of artifacts and contexts to identify specific loci where a given activity or set of activities took place. These activity areas can then be related and compared to each other within a given household or between households to investigate the range of activities that each household was engaged in and to gauge the level of interconnectedness between households. As a result, household archaeobotany works best with an intensive horizontal sampling strategy.

Knowledge of the spatial configuration of activity areas across the site can provide information about food processing, the organization of agricultural tasks, and social interactions within and between households. A number of ethnoarchaeological studies examining agricultural systems and social practice exist and facilitate the interpretation of archaeobotanical data (Campbell 2000; Stevens 2003; van der Veen and Jones 2006). These studies show, for example, that in dry regions certain tasks associated with agriculture, such as threshing, are likely to take place in open areas because of the special requirements for the task (Hillman 1984). Other tasks, such as the removal of contaminants from agricultural produce in preparation for consumption, are flexible tasks and can take place in communal areas or within individual households (Hillman 1984; Jones 1984). When archaeobotany is used to help locate and identify activity areas that can be conducted in multiple locations, task areas provide one possible line of evidence to investigate the degree to which crop processing was being practiced communally or by individual households. A greater number of "flexible tasks" occurring within the household may suggest a higher degree of household autonomy because people are making a conscious choice to work within the house and not in communal areas. These inferences would be supported by the location and size of storage facilities. Twiss (et al. 2009), for example, examined the location of plant and animal storage in Building 52 at Çatalhöyük. Because large stores were kept in a secluded room, out of view from the main room that would have been used to entertain guests, they argue for emerging economic privatization.

The consideration of patterning in archaeobotanical data at both the site and the household level enables the archaeobotanist to compare plant use within an individual household to the overall pattern at the site and detect any spatial variation. In instances where numerous contemporary houses with similar levels of preservation are exposed, it should be possible to examine differences between households that may represent household preference, social status, or ethnic enclaves. Furthermore, because the steps in plant processing are typically systematic and repetitive, the location of the activity areas demonstrates how plants may have moved around the site and/or within individual houses.

In order to investigate the economic organization of the household, it is necessary to examine the production, processing, and storage of agricultural products. Assuming that trade in fully processed cultivars was not extensive, crop processing would have taken place within different activity areas in and around the household and settlement. While some of these activity areas (threshing floors and fields, for example) are not routinely targeted by archaeologists, data obtained from within the settlement typically yields sufficient information to evaluate many components of crop processing. Before archaeobotanical data can be interpreted appropriately, however, it is necessary to simultaneously weigh the most likely means through which the plants arrived at the site, the method of preservation, the archaeological context of the samples, and the ecology of each taxon identified. The remains from Kenan Tepe (and indeed the majority of plant remains recovered in the Near East) were preserved predominantly by charring; few were preserved through mineralization or impressions in pottery, and none were preserved through desiccation, water-logging, or due to proximity to metal oxides.[1] Consequently, the following discussion of the relationship between activity areas and archaeobotanical data relates specifically to charred plant remains.

Interpreting Archaeobotanical Remains and Defining Activity Areas

Within the archaeobotanical literature, it is generally accepted that the potential for plant remains to become preserved varies across a site, between archaeological context types, and between species and plant parts. Charring can result from accidental fires, catastrophic fires, or in the case of hearths and ovens, intentional fires. In the case of accidental and catastrophic fires, entire structures are typically consumed, allowing for the potential preservation of any plant material within the house. These occurrences, while devastating for the inhabitants of the dwelling, provide a useful opportunity for archaeobotanists to investigate activity areas and plant use within the household at the time of its destruction, assuming that post-depositional processes have not negatively affected plant assemblages. In instances where a structure was not consumed by fire, charring is typically restricted to hearths and ovens and the potential for preservation is restricted to a small area. The remains of an in situ hearth may provide information on household waste and the last fuel used, but any plants used or stored on the surrounding floor are unlikely to survive. Pyric histories differ between archaeological contexts and because of this, for comparative purposes, it is important to group samples with similar pyric histories when considering the activities that they represent (Miller in Schwartz et al. 2000: 445). Dennell (1972) provides a list of commonly encountered context types at tell sites that includes: (1) storage jars, silos, and storage pits; (2) plant material in or associated with ovens or hearths; (3) floor deposits; (4) middens or rubbish pits; and (5) fill

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[1] Zohary and Hopf (2000) and Hansen (2001) provide discussions of methods of preservation.

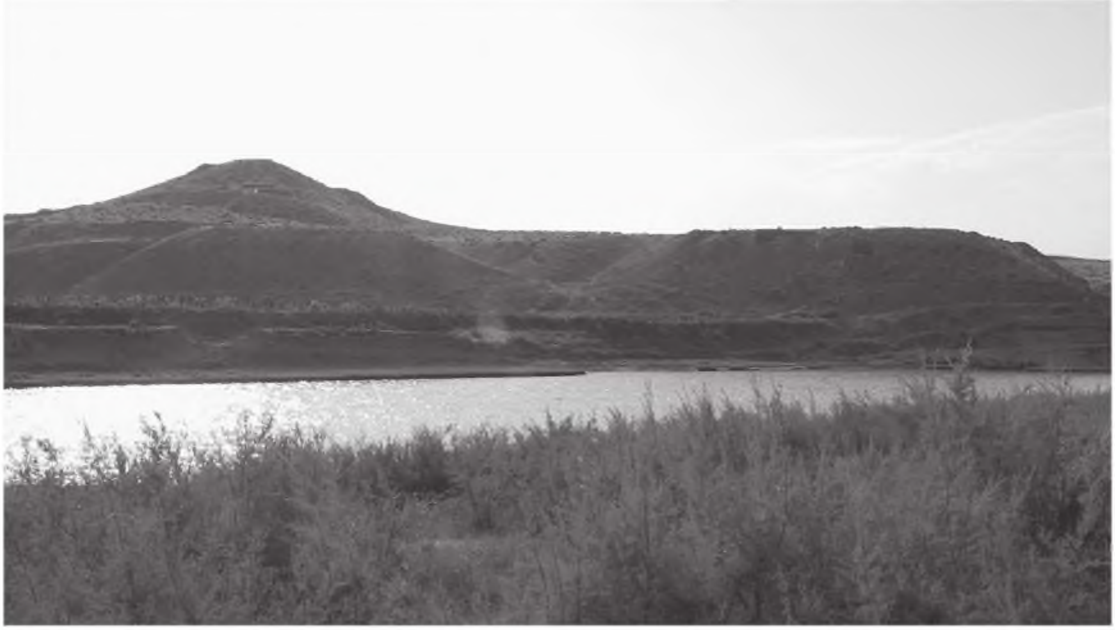

Fig. 1. Kenan Tepe mound (photograph taken by Bradley Parker; reproduced courtesy of the Upper Tigris Archaeological Research Project).

deposits, the latter of which generally contain sediments of mixed origin. Due to the difficulties involved in interpreting fill samples of mixed origin, plant remains from fill are often of limited value to archaeobotanists. Each of the other context types is considered in more detail below.

Storage Jars, Silos, and Storage Pits

Silos provide a wealth of information regarding ancient agronomy when catastrophic burns have charred whole store-rooms or storage facilities, since the associated weeds can indicate the agronomic methods used, harvesting techniques employed, the use of irrigation, and the stage of crop processing reached. The contents of storage pits frequently vary, and the extent to which crop production can be examined depends upon the level of preservation within the pit. Charred material obtained from storage jars can be challenging to interpret; as van Zeist and Bakker-Heeres (1985: 290) observed, unless the vessel is charred, it is unlikely that any charred plant remains contained within it were actually stored in the vessel. Sediments within vessels more likely represent secondary deposits that can be thought of as "settlement noise." Van Zeist (1999/2000: 119) reasons that only when large numbers of a single economic species are recovered from a jar can they be considered the original contents.

When the contents of a sample are deemed to be the remains of a stored crop or crop byproduct, plant husbandry can be considered. The most thorough ethnographic studies of traditional (nonmechanized) cereal processing, conducted with the goal of better understanding archaeological assemblages, were carried out by Gordon Hillman in Aşvan, Turkey (Hillman 1972, 1973, 1984) and by Glynis Jones on the Aegean island of Amorgos (Jones 1983, 1984, 1990 [for 1988]). Hillman (1984: 3) observes that each processing step has a consistent and observable effect on the crop and its byproducts whereby, for free-threshing cereals, the bulk of the undamaged straw, most of the rachises, and coarse weeds are removed through threshing; light chaff, longer straw fragments, the lightest weed seeds, and heads are removed by winnowing; and most of the remaining straw nodes, weed heads, and remaining rachis fragments, tail grain, and weeds smaller than prime grain are removed by sieving. Any remaining contaminants the same size as prime grain would be removed from the sieved grain by hand, rendering it ready for processing for consumption. The removal of contaminants is a flexible task and could take place in a communal area or could be done in private on an as-needed basis.

The sequence of processing, and therefore resultant byproducts at each stage, differs for glume wheat, but the plant parts removed with each process can similarly be predicted (Al-Azem 1992; Hillman 1984). Given that the range of methods for accomplishing each process without modern technology is relatively limited and that separation of the components relies on physical properties such as size, weight, and density, Hillman's model may be carefully applied outside of Turkey. This assertion was corroborated by Jones (1984) in Greece and Al-Azem (1992) in Syria. Hillman cautions that while there are few possibilities to rearrange the order of the major operations, the processing sequence can be flexible, mostly at the stage when spikelets or grain are being prepared for storage, but broadly speaking, products and byproducts are typically predictable and are discernible in the archaeological record. While is it possible to examine stages of crop processing and storage, Jones (1998: 97) argues that it is not always possible to argue with certainty that stored comestibles are destined for human consumption, since products stored as food may later be used as fodder, either due to excessive surplus or spoiling, and the converse may be true in times of need. Based on her studies at Amorgos, she found that the same storage facilities were used for both food and fodder alike (Jones 1998: 96). Al-Azem noted similar patterns of food and fodder storage while conducting ethnographic research in Syria.

Middens

Middens are another context frequently encountered on Near Eastern occupation sites. They are often associated with household waste, as well as cleanings from hearths or ovens. McCorriston (1998: 46) discusses the potential of middens to provide "an averaged and homogenized mix of the practices that regularly exposed plants to fire [which] . . . mix the accretive deposits from hundreds of activities over perhaps decades." Since middens contain long-term accumulations of household debris, perhaps originating from several households, they provide information very different from short-term accumulations such as hearths and intact silos (McCorriston and Weisberg 2002). This does not detract from their value with respect to household archaeology, however; instead, it adds another temporal dimension to the consideration of households and plant use.

Floors

The extent to which a floor contains preserved plant remains depends upon the nature of the floor, the frequency of cleaning, and the extent to which the floor was exposed to fire. Floors can be expected to contain small amounts of trampled domestic debris, although debris is less likely to become incorporated into hard plaster floors than an earthen floor. In the absence of a catastrophic fire, floors do not typically contain rich botanical assemblages, although remnants preserved on parts of the floor surrounding an indoor hearth would be an exception to this generalization. Thus, floor assemblages are generally composed of supra-surface fill that accumulates during post-abandonment rather than use and, therefore, often share similarities with midden remains (McCorriston, personal communication). In instances where a catastrophic fire has destroyed a room or a structure, samples from sealed floors can provide a detailed picture of the distribution of plant storage and plant use that would, in other circumstances, not be preserved, thereby maximizing the potential for observing short-term activity areas.[2]

Ovens and Hearths

Both ovens and hearths involve the intentional use of fire and offer greater potential for plant preservation through charring. Within domestic settings it is generally believed that the plant remains from a hearth provide information regarding fuel use in antiquity, domestic "spill," and floor sweepings. Since hearths and ovens were most likely cleaned regularly and the contents dumped outside of the household (perhaps into a midden), hearths represent short-term accumulations and represent a snap-shot of plant use.

Plant remains from ovens and hearths, while encountered within a domestic setting, cannot be assumed to be strongly related to human diet (van Zeist and Bakker-Heeres 1985: 291). Research by Miller and Smart (1984; Miller 1984) underscores this point and they argue that the introduction of seeds to a site via animal dung needs to be seriously considered. Following her examination of plant remains from Malyan in Iran, Miller (1984: 45) noticed that a higher proportion of weed seeds relative to wood charcoal likely represented the use of dung cakes as fuel. This idea was supported by the identification of charred weed seeds embedded in burned dung from archaeological samples. Charred dung can be identified in the archaeological record as "amorphous mass[es] of charred stems oriented in various directions within a friable matrix of fine grained, charred material" (Miller and Smart 1984: 18).[3] Miller's studies of four modern samples from a prepared hearth, hearth sweepings, household debris, and a fire pit within a forest close to Malyan lend support to her argument, whereby charred seeds of forage plants were found in the household remains of burned dung and none were found in the forest wood fire. Miller (1996) argues that, for sites lying in areas where wood is scarce, where dung-producing animals are present, and where assemblages of charred material from primary hearth contents or secondary dumping areas contain burned dung or seeds from plants that could have been eaten by dung-producing animals, the potential for use of dung fuel should be seriously considered. Miller and Smart (1984: 20) are careful to note, however, that other interpretations are possible and that multiple factors need to be considered before dung use can be ascertained. It is likely, however, that due to the widespread intentional burning of dung and the enhanced preservation of any plant material therein, this mechanism of seed introduction plays an important role in the Near East. Thus, when dung use is clear from the botanical assemblage and/or the presence of dung, it is possible to consider herding activities, landscape use, and the extent of foddering.

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[2] Excellent examples include Building 52 at Çatalhöyük [Twiss et al. 2009] and Structure 4 at Kenan Tepe, discussed in this chapter.

[3] Charles (1998) also provides guidelines for identifying dung remains.

Defining Activity Areas

Together, these examples highlight the importance that archaeobotanists have traditionally given to archaeological context when interpreting archaeobotanical samples. Typically, archaeobotanical samples are associated with a contextual description that was written in the field at the time when the sample was collected. As Hillman points out, however, caution should be exercised with regard to such descriptions:

> In my experience, it is more common for the composition of samples of plant remains . . . to provide the basis for assigning past functions to the features, structures, or even whole sites from which the samples were recovered than it is for the excavator's identification of context-type to provide the basis for interpreting the composition of samples of plant remains. This observation cannot be stressed too strongly." (Hillman 1981: 125)

We wholeheartedly agree, and this statement has very important implications for the practical approach to reconstructing activity areas based on plant remains. Should the archaeobotanist accept the field archaeologist's description of a sample's origin and use this as the basis for interpreting the remains? From our experience, these descriptions, while often detailed and well-informed, can be highly subjective and subject to change during the course of an excavation. In accepting these descriptions as fact, researchers adopt a top-down approach and deny themselves the opportunity to contribute to the definition of activity areas and the wider understanding of the settlement. Should the archaeobotanist, then, ignore any description of archaeological context and define activity areas based solely on consideration of the plant remains? This approach seems equally perilous, if samples are interpreted in a vacuum with no consideration whatsoever of the sample's origin. The most productive mode of understanding ancient plant use and activity areas probably lies somewhere in between these opposing methods of approaching interpretation. By integrating household archaeology and archaeobotany and placing emphasis on activity areas, the process of interpretation becomes more dynamic, and the flow of information is no longer uni-directional. It is the job of the archaeobotanist, then, to simultaneously weigh information provided by excavators alongside the data that they have themselves generated and interpret the remains and the activities that they represent in the most parsimonious manner. This approach can only enhance the understanding of ancient settlements but does present some practical and logistical difficulties, since it necessitates an ongoing dialog between researchers well after the field season. Sadly, funding to facilitate collaboration after an excavation is complete is often difficult to obtain, but group discussions can be achieved through online forums like the one adopted by the excavators at Kenan Tepe. This forum has allowed for ongoing discussions of the remains and allows for interpretations to be updated and revised as each specialist furthers their analysis. The interpretation of the plant data outlined below has benefited greatly from this rapid exchange of information.

Examining Activity Areas at Kenan Tepe

Kenan Tepe is a multiperiod site located on the Tigris River approximately 15 km east of the town of Bismil in southeastern Turkey (figs. 1, 2). The site consists of a large mound that has been excavated by a team led by Bradley Parker for seven years (Parker and Dodd 2005; Parker et al. 2003, 2004, 2006, 2008, 2009; Parker, this volume). Five broad phases of occupation have been exposed: the Late Ubaid (ca. 4700–4400 cal. B.C.E.), the Late Chalcolithic (ca. 3600–3100 cal. B.C.E.), the Early and Middle Bronze Ages (ca. 3000–1800 cal. B.C.E.), and the early Iron Age (ca. 1050–900 cal. B.C.E.) (Parker et al. 2006). This study focuses on the Ubaid, an interim period that postdates the emergence of small agricultural villages and predates the first large territorial states (Stein and Rothman 1994). To date, very little is known about plant use during the Ubaid Period. A survey of the published literature revealed a limited amount of data pertaining to Ubaid sites, generally consisting of one or two samples per site, including al-Ubaid, Ur, Tell al-ʿAbr, Ras al-ʿAmiya, Tell Uqair, Tel el-Oueili, Ziyadeh, Hammam et-Turkman, Tell Kosak Shamali, and Tell Afis, underscoring the need for more archaeobotanical research at sites of this period (fig. 2; Akkermans and Schwartz 2003; Hall and Wooley 1927a, 1927b; Hole et al. 1998; Huot 1989, 1992; Lloyd et al. 1943; McCorriston 1998; Stronach 1961; van Zeist et al. 1988; Wachter-Sarkady 1998; Weiss 1991; Willcox 2003; Woolley 1955).

Sample Collection at Kenan Tepe

Excavations at Kenan Tepe employed an intensive and systematic sampling strategy that paid particular attention to artifact-rich deposits such as hearths and middens. Samples were collected from a variety of contexts, including house floors, outdoor surfaces, hearths, ovens, pits, burials, vessel contents, and wall collapse, thereby allowing plant use across the site to be investigated (Foster 2009). High resolution sampling of all surfaces was conducted using the Upper Tigris Archaeological Research Project's Household Archaeological Protocol (hereafter "HAP"; see Parker et al. 2009). HAP is a data-collection strategy in which all of the soil in a sample is subject to flotation. The HAP strategy is designed to maximize the recovery of botanical and microarchaeological data while ensuring that multiple contexts are sampled within and around each household. Samples varied between three and eight liters and were collected from the part of each HAP feature least subject to post-depositional disturbance (Foster 2009). Between 2000 and 2007, 302 Ubaid archaeobotanical samples were collected; these samples are currently stored at the University of Connecticut, where analysis is ongoing.

Sediment samples were floated using a modified Siraf-type flotation tank (Nesbitt 1995; Williams 1973). Light fractions were collected in a 250-micron mesh screen and dried in the shade. Heavy fractions were transported to the University of Utah and to the University of California, Berkeley, where they have been subjected to intensive micro-debitage analysis (Foster 2009; Parker et al. 2009). The archaeobotanical remains are being sorted under a binocular stereo-microscope capable of magnifying up to 70×, and identifications are made using the comparative collection

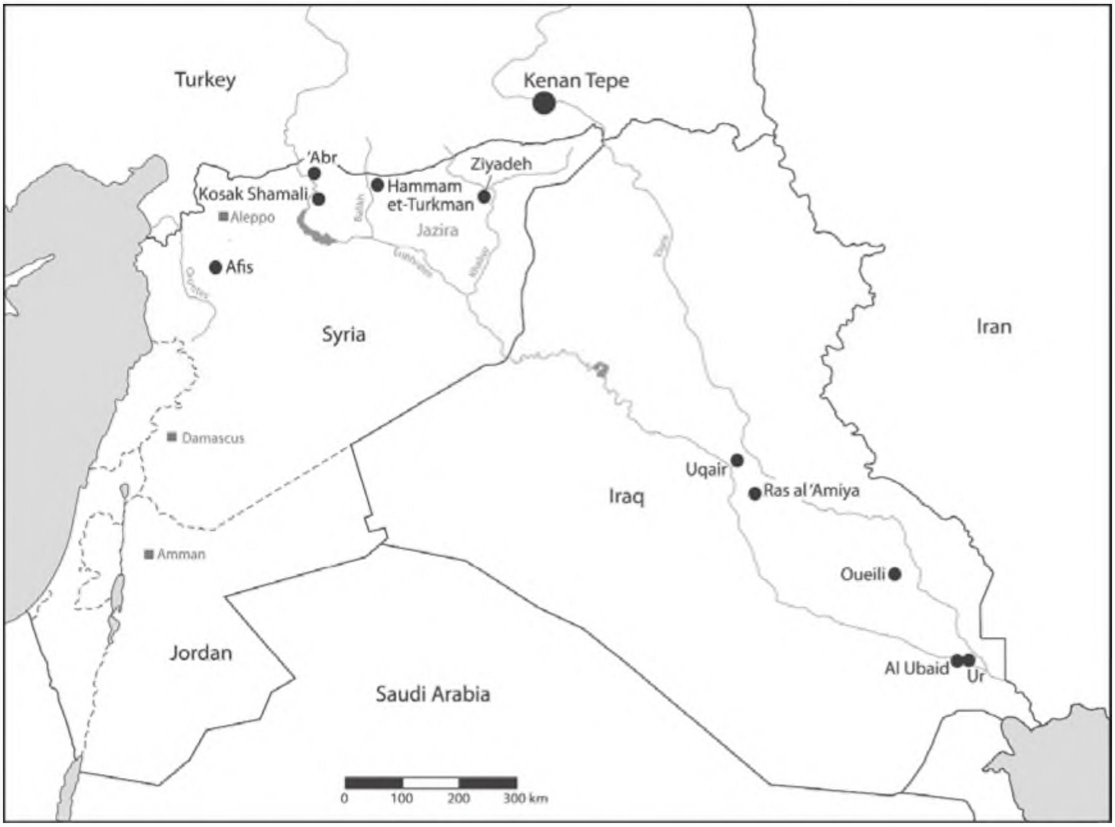

Fig. 2. Map showing location of Kenan Tepe and other Ubaid sites that have yielded published archaeobotanical data.

at the University of Connecticut. A range of flora and seed identification manuals have also been used to assist with identifications and provide ecological and ethnobotanical information (Davis 1965–88; Feinbrun-Dothan 1977–88; Nesbitt 2006; Niane 1999). Since the results presented here are preliminary, seed counts are not provided, but relative abundances are discussed.

Archaeobotanical Remains

The data from eight archaeobotanical samples are presented here. While it is not possible to make broad statements regarding plant use at the site from these eight samples, it is possible to discuss plant use in one particular structure. These samples were excavated from either collapse or floor deposits from Structure 4, a multi-roomed tripartite Ubaid house that was uncovered in Area D on the high mound at Kenan Tepe (Table 1; contextual information is listed in Table 2; and see Parker, this volume). The structure was destroyed by a catastrophic fire that led to excellent preservation of the botanical remains and provided optimal conditions for examining activity areas within the household. Samples 2 and 4 originated in Room 3, a small side room, and all of the other samples came from the central Room 1 (fig. 3). Initial inspection of the archaeobotanical data raises a number of interesting points regarding plant processing and plant foods within the burned structure. All of the

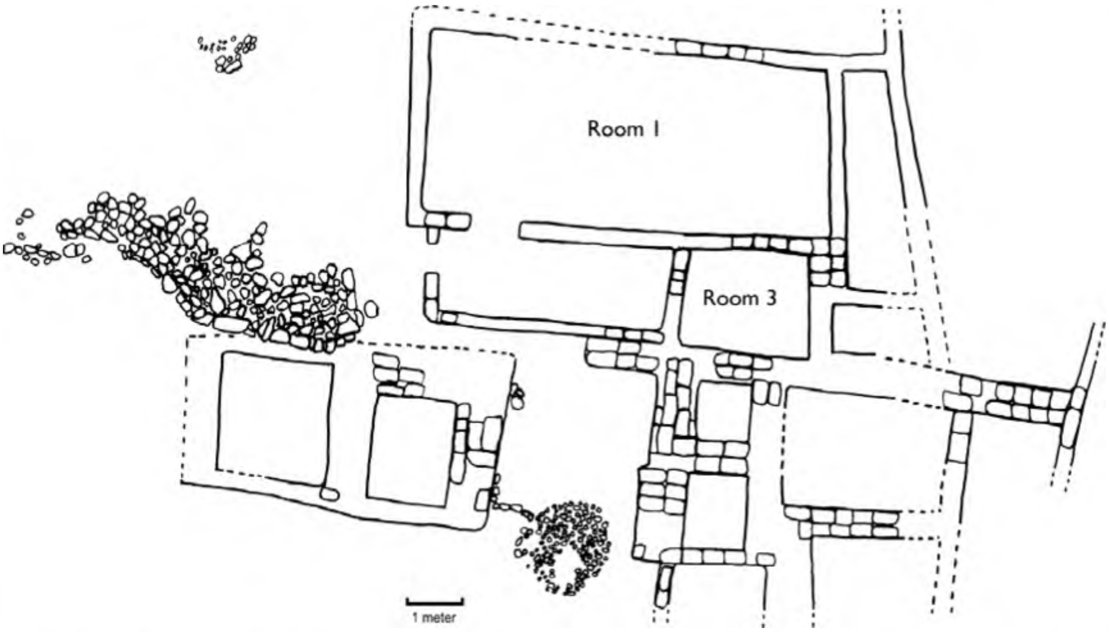

Fig. 3. Plan of the burned Ubaid house at Kenan Tepe (drawn by Bradley Parker, reproduced courtesy of the Upper Tigris Archaeological Research Project; north to the right).

samples contain large amounts of well-preserved cereals. In all samples except for Sample 7, barley appears to be the most numerous, although large amounts of wheat are also present, including emmer (*Triticum dicoccum),* einkorn (*T. monococcum*), and free-threshing wheat (*T. aestivum/durum).* Sample number 7, however, is made up almost entirely of wheat (*T. dicoccum, T. monococcum,* and *T. aestivum/durum*) and contains only traces of processing debris and small weed seeds. Compared to the cereals, there are far fewer legumes represented in the samples. These results share some similarities with those dating to the 5th millennium B.C.E. from Tell Kurdu in the Amuq, where wheat and barley were important crops (Yener et al. 2000). Crop legumes at Kenan Tepe include lentil (*Lens culinaris), Vicia* sp. or *Lathyrus* sp., and the occasional pea (*Pisum* sp.). Interestingly, most of the legumes that have been found to date appear to be very well preserved. It is unclear whether the disparity in cereal and legume abundance reflects differential preservation of cereals and legumes or a preference by the Ubaid Period inhabitants of Structure 4 for cereals. This is a pattern that is witnessed at many Near Eastern sites, however, and one that it is often attributed to preservation biases (Smith 2007).

The spatial distribution of the finds is particularly interesting. The excavators found that a number of activities were taking place on the roof of the house, leading to the belief that the inhabitants of the burned house used the roof space as a work area and that, during the fire, the roof collapsed onto the lower surface (Parker, this volume). Samples from Room 1 are from roof collapse or a layer of collapse above the floor. Samples from this central room fall into two broad categories: those that contain nearly completely clean cereals (Samples 1, 3, 5, 7, and 8) and those that contain some processing debris (such as spikelet forks, glume bases, rachis fragments, and ce-

Table 1. Contents of eight samples dating to the Ubaid 2/3 excavated in 2007 from burned Structure 4 located in Area D on the main mound at Kenan Tepe

Sample Number	1	2	3	4	5	6	7	8
Mass (g)	6.93	8.23	3.39	4.32	1.76	28.31	177.19	5.84
Volume (ml)	21	37.25	12.75	19.3	3.75	77	489	15.5
Wood	x	x	x	x				x
Cereals								
Hordeum sp.	xxx	xxx	x	xx	xxx			xxx
Triticum sp.	x	xxx	x	x	xxx		xxx	x
cf. *Triticum* sp.								
Triticum monococcum		x		x			x	
Triticum dicoccum	x	x	x		x		xxx	x
Triticum durum/aestivum		x					x	
Triticum tail grains		x		x				
Aegilops sp.			x					
Cereal indet.	xxx	xxx	xxx	xxx	x	x	xx	xxx
Cereal rachis fr.		x	x	x		xx		x
Cereal spikelet forks	x	x	x	xx	x	x		x
Cereal glume bases	x	xxx	x	xxx		xxx		x
Culm fr. > 2mm		x			x	x		
Culm fr.< 2mm		x	x	x	x	x		
Culm fr. < 2mm		x				x		
Cereal embryos								x
Legumes								
Lens culinaris		x		x				
Pisum sp.	x	x						
Vicia ervilia								
Lathyrus sp.								
cf. *Vicia* sp.								
Vicia/Lathyrus sp.		x		x				
Leguminosae (medium)		x	x	x				x
Leguminosae (large)		x						
Vitis sp. pedicel								
Noncultivars								
Bolboschoenus/Carex sp.			x					
Gramineae	x	x	x	x	x			x
Hordeum sp. (wild)	x	x		x				x
Lolium type								
Galium/Asperula sp.		x	x	x				
Rumex sp.								
Buglossoides arvense								
Buglossoides tenuiflorum								
Vaccaria pyramidata		x						

Table 1. Contents of eight samples dating to the Ubaid 2/3 excavated in 2007 from burned Structure 4 located in Area D on the main mound at Kenan Tepe *(cont.)*

Sample Number	1	2	3	4	5	6	7	8
Trigonella sp.		x						
Medicago radiata								
Astragalus type								
Leguminsoae (small)				x				
Adonis sp.								
Teucrium type								x
Malva sp.								
Compositae				x				
Cucurbitaceae				x				
Other plant remains								
Parenchyma								
Nut fr.								
Twig								
Non-plant remains								
Vitrified Remains		x				x		x
Sheep/goat dung		xx		x				
Mouse dung								
Bone		x	x	x				x
Shell			x					x

real embryos; Sample 6). Sample 1 is relatively large, so given its size combined with the lack of any processing debris or small weed seeds, it may represent the remains of cleaned wheat stored on the roof, ready for use. Because samples from the room likely experienced some mixing during the collapse, it is not possible to discuss in detail the nature of discrete activity areas on the roof at present, although they likely existed. Given the presence of sizeable amounts of processing debris and weed seeds in some samples, however, it is likely that at least one roof-top activity area was related to some of the final stages of cereal processing.

Samples 2 and 4 from Room 3 differ from the others in that they contain very large amounts of processing debris and a greater frequency of weed seeds. The presence of charred dung in these samples, combined with the mixture of chaff, field weeds, and relatively small amounts of wood charcoal, strongly suggests that these remains are from dung fuel and that one activity area within this small room on the east side of Structure 4 may have been fuel storage. This conclusion is interesting, because it is in this room that the excavators believe the fire started (Parker, this volume). The presence of dung provides insights into the local environment and the ancient diet of herded animals at Kenan Tepe. Weeds within the samples include *Galium*/*Asperula* and *Vaccaria pyramidata,* both of which are common weeds in agricultural fields. Small legumes, such as *Trigonella* sp., are also present. These plants can be found in agricultural fields but frequently occur in pasture land. The presence of

Table 2. Contextual information for samples listed in Table 1.

Sample Number	Locus	KT	Item	Context description
1	4107	4	2	Top of collapse layer in Room 1
2	4123	12	2	Collapse from Room 3
3	4112	5	2	Lower half of collapse in Room 1
4	4123	4	2	Collapse in Room 3
5	4127	9	2	Small sliver of fill above floor inside Room 3 collected from eastern-most section of the trench up against the west baulk.
6	4112	24	3	Lower half of the collapse layer in Room 1
7	4112	24	2	Lower half of the collapse layer in Room 1
8	4111	9	2	Collapse from Room 1

large amounts of culm and rachis fragments, spikelet forks, charred dung, and wheat and barley grains within the dung samples strongly suggest intentional foddering. The examination of additional dung samples is necessary to determine whether this was common practice at the site. Further supporting this idea of intentional foddering is a large area of chaff impressions under part of a collapsed wall adjacent to Structure 4. The excavators interpreted this as a pile of chaff stored against the wall of the Ubaid house (Parker, this volume).

A number of cell structures are also associated with Structure 4 (Parker et al. 2008). These cells have been interpreted as chambers for storing grain, owing to the presence of grain pseudomorphs and the fact that they are too small for habitation (Parker, this volume). This type of storage area and style of architecture is known from other Ubaid Period sites such as Tell Kosak Shamali and Tell al-ʿAbr (Hammade and Yamazaki 1995; Nishiaki 1999). Unfortunately, only a few charred botanical remains were recovered from these cells, indicating that either the cells were empty at the time the house was abandoned or, more likely, any grain stored within was not preserved, since the fire did not significantly affect the cells. The existence of grain pseudomorphs strongly suggests that grains were likely stored within the cell structures, although it is difficult to assess the quantity.

Conclusion

The eight Ubaid archaeobotanical samples that have been analyzed to date illustrate the potential that the samples from Kenan Tepe have to answer questions regarding plant preference, the agricultural system, and activity areas both at the household and site level. Because of the excellent preservation of Ubaid remains at the site, combined with an intensive horizontal sampling strategy, we have the opportunity not only to investigate what kinds of plants were being grown and consumed at the site but also to discuss issues of where the various stages of plant processing took place both across the site and within the individual household. In order to address these questions, multiple lines of evidence must be considered. For example, at Kenan Tepe it is possible to imagine people storing partially processed grain in the cell structures and then transporting some of that grain to the roof for final processing in preparation for consumption, although with the data at hand, this is difficult to substantiate with any degree of certainty. The large, clean wheat sample (Sample 7) was found in association with grass or reed baskets as well as unfired clay vessels, which may be the remains of large basins or tubs (Parker et al. 2009). Given this contextual association, we are relatively certain that one activity occurring on the roof of Structure 4 was grain processing and temporary storage. Another hypothesis is that the grains had recently been threshed and laid out to dry before being moved into the cell structures. We have observed this practice still occurring in Turkey today. The presence of dung stored in a relatively inaccessible room inside Structure 4, as well as the probable storage of grains both within the cell structures and on the roof, may suggest a higher level of household independence than witnessed in earlier times, although the temporary storage of grain on the roof, which tends to be a very visible and social area, may contradict this idea. More analysis is required before the relationships between public and private household spaces and their relations to the visibility of agricultural produce can be stated with any degree of certainty.

The combination of household archaeological and archaeobotanical method and theory has many benefits, including mitigating some common preservation biases associated with household archaeology, generating a more cohesive picture of the household and the daily lives of average people, and has the potential to address many interesting topics related to the Ubaid Period. By examining the location of storage facilities and combining this with a spatial analysis of plant-based activity areas, it should be possible to consider changes in the degree of household autonomy or privatization through time. Archaeobotanical data has much to offer activity-area analysis; while knowledge of the archaeological context of a sample is essential when interpreting plant data, this does not mean that the flow of information from the field to the archaeobotanist should be unidirectional. More often than not, knowledge of the plant remains can help refine or even redefine the context, thereby providing a wealth of information on activities occurring in the past.

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Beyond the House and into the Fields:
Cultivation Practices in the Late PPNB

Chantel E. White and Nicholas P. Wolff

Introduction

The Pre-Pottery Neolithic Period marked an era of monumental social and economic development in Southwest Asia. The emergence of agriculture transformed subsistence practices in the region, concurrently altering not only the human diet but the customs and traditions of food production, preparation, and consumption. Archaeobotanical studies have provided critical evidence of the physiological processes of plant domestication yet so far have rarely been extended to shed light on the specific tasks associated with farming practices during the Pre-Pottery Neolithic in the southern Levant. Little is known about how agricultural activities were organized and carried out during this time or the role such activities played in reshaping the structure of daily life in early Neolithic communities.

This study takes as its primary focus the suite of agricultural activities associated with cereal production in the Late Pre-Pottery Neolithic B (Late PPNB), using the archaeological site of el-Hemmeh, Jordan, as a case study. Carbonized macrobotanical evidence from el-Hemmeh is supplemented by published data from other sites, as well as a variety of ethnographic examples, to investigate the social and technological organization involved in cereal production in the Late PPNB. As the primary economic unit of Late PPNB communities, the household provides an essential framework for studying aspects of labor coordination, decision-making, and techniques associated with small-scale agriculture. Building on the applications of a baseline functional definition of the household as a co-residential task group, we argue that Late PPNB cereal cultivation—and especially activities related to barley production—can effectively be approached as a form of household "craft" (*sensu* Hendon 2006) involving the communication and transmission of a complex body of knowledge within and between small-scale social groups from generation to generation. Using this concept, tasks that physically take place outside the house and off-site (e.g., activities relating to field preparation, maintenance, crop harvesting, and processing) offer an opportunity to explore modes of social reproduction and illustrate the practices of everyday life during this important time period.

Household Economy in the Late PPNB

The Neolithic, when viewed from an economic standpoint, is often defined by the emergence and intensification of agricultural practices.[1] In Southwest Asia, the food-producing economy is cited as one of the most significant factors contributing to the development of large villages, expanding trade networks, and increasing social complexity (Bar-Yosef and Meadow 1995). The Pre-Pottery Neolithic spans more than 3,000 years in the southern Levant and is traditionally divided into the Pre-Pottery Neolithic A (PPNA, ca. 11,700–10,500 cal. B.P.), the Pre-Pottery Neolithic B (PPNB, ca. 10,500–8700 cal. B.P.), and the Pre-Pottery Neolithic C (PPNC, 8700–8250 cal. B.P.) (Kuijt and Goring-Morris 2002: 366). The focus of this chapter is the Late PPNB (ca. 9250–8700 cal. B.P.), a time during which communities grew larger in size and population than previously seen in the Neolithic. Village size increased from an estimated mean site size of 3 ha in the Middle PPNB to 10 ha in the Late PPNB (Kuijt 2000a: 85), and the term "megasite" is frequently used to refer to these large settlements (Bienert et al. 2004; Rollefson 1997; Simmons 2007). Little is known about the plant-based portion of the subsistence economies of these megasites in the southern Levant or smaller contemporary sites, beyond the assumption that people began intensively cultivating agricultural staples such as wheat, barley, and legumes to sustain their larger populations.

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[1] While we recognize that the terms "agriculture" and "farming" pertain equally to the raising of livestock and the planting of crops, in the context of this essay, the latter is intended unless

Household archaeology provides an effective framework for understanding the dynamics of Late PPNB agricultural systems at the economic, technological, and social level. Here, at the outset, we employ an established functional perspective to approach the economic aspects of the household. As fundamental elements of society, households have been construed as the building blocks that "articulate directly with economic and ecological processes" (Wilk and Rathje 1982: 618) and "embody and underlie society at its most basic level" (Ashmore and Wilk 1988: 1). The household is widely understood to be a task-oriented residence unit whose membership is based on overlapping categories of function or spheres of activity. In addition to co-residence, these aspects include production, consumption, generational transmission of wealth (both material and immaterial), and reproduction (encompassing the socialization of children as well as procreation) (Wilk and Netting 1984: 5–17).

The application of these foundational precepts (as well as subsequent formulations) to Neolithic houses and households in the Near East provides an important springboard for our discussion here (Byrd 2000, 2005; Düring 2007; Flannery 1972, 2002; Kuijt 2000b; Wright 2000). Although household organization no doubt varied throughout the Pre-Pottery Neolithic Period in the southern Levant, Byrd (2000) has identified a general continuity in household size during the PPNA, Early PPNB, and Middle PPNB Periods. He argues that residences accommodated simple households, with a trend toward increasing household wealth and inter-household variation beginning in the Middle PPNB (Byrd 2000: 65). The presence of extramural silos dedicated to the storage of surplus wild grain, at least in the PPNA (Kuijt 2008), suggests that food storage—if not also the activities of collection and cultivation—may have been organized by a network of domestic groups or perhaps by the larger community.

During the Late PPNB, population aggregation within many southern Levantine communities created new social and economic pressures, and a reorganization of household structure took place. In a study of Late PPNB cooking practices, Wright

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it is made otherwise explicit. This is certainly not to negate the undoubted importance of animal husbandry during the Pre-Pottery Neolithic, simply that our scope here concentrates primarily on the social and technical aspects of intensive plant cultivation.

(2000: 112, 115) has noted an increase in milling-tool assemblages and specialized cooking facilities and proposes that more economically active individuals were present per house during this period. She states that "the picture is one of intensified production of food for larger groups of people; possibly multiple food preparers per house; larger houses; and an emphasis on privacy, including private property" (Wright 2000: 114). This is reflected in the architectural changes and food storage practices in the Late PPNB. Large numbers of enclosed storage spaces were constructed on the ground floor of two-storey dwellings, and access to these areas was restricted both physically (through small doorways) and in terms of visibility outside the home (Kuijt 2008: 306). It is therefore probable that the household managed its own food supply and storage, forming the primary economic unit of Late PPNB communities. The household would also have assumed a new social configuration to manage increased labor needs associated with feeding larger populations through farming.

Archaeobotany and the Neolithic Economy

Understanding the development of agricultural production in the PPNB is challenged by a number of issues, including typically small botanical datasets and gaps in the archaeobotanical record (Neef 1997: 605). Despite a wealth of information from sites dating to the PPNA when the first cultivated cereals appear (Bar-Yosef and Kislev 1989; Colledge 2001), the economy of the Late PPNB is still in need of closer examination. Current evidence suggests that communities relied largely on an economy of domesticated cereals and legumes, although subsistence strategies must have varied across the region's many phytogeographic zones (Kuijt and Goring-Morris 2002). Of the many Late PPNB sites excavated in the steppe zone of the southern Levant, including ʿAin Jammam, Baʾja, Wadi Shuʾeib, es-Sifiya, ʿAin Ghazal, Abu Suwan, Basta, and Khirbet Hammam, few have systematically recovered large numbers of plant remains (fig. 1). Even fewer have published detailed reports of their archaeobotanical findings.

Instead, discussions of PPNB crop cultivation in the southern Levant have relied primarily on botanical data from a few critical sites, namely Basta, ʿAin Ghazal, and Beidha (Helbaek 1966; Neef 2004; Rollefson and Simmons 1985). At these sites, crop plant assemblages consist primarily of barley (*Hordeum spontaneum* L./*distichum* C. Koch) and emmer wheat (*Triticum dicoccum* Schrank.), as well as legumes such as bitter vetch (*Vicia ervilia* L.), lentil (*Lens culinaris* Medik.), and pea (*Pisum sativum* L.). Additional botanical remains consist of wild plant species, most notably small-seeded legumes and wild grasses. The subsistence economy of the Late PPNB in the southern Levant depended largely on cereal agriculture, as well as the herding of sheep and goats. Köhler-Rollefson and Rollefson (1990) have convincingly argued for the emergence of an intensified agropastoral system during this time and the use of complex animal husbandry practices, including fodder provisioning and manipulation of weaning practices (Makarewicz 2007). The presence of these animals is attested in the archaeobotanical record by the remains of burned sheep/goat dung and preserved seeds, consisting primarily of small legumes and weeds that would have been used as feed/fodder.[2]

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[2] See Miller 2002, Charles 1998, and Miller and Smart 1984 for discussion on this topic.

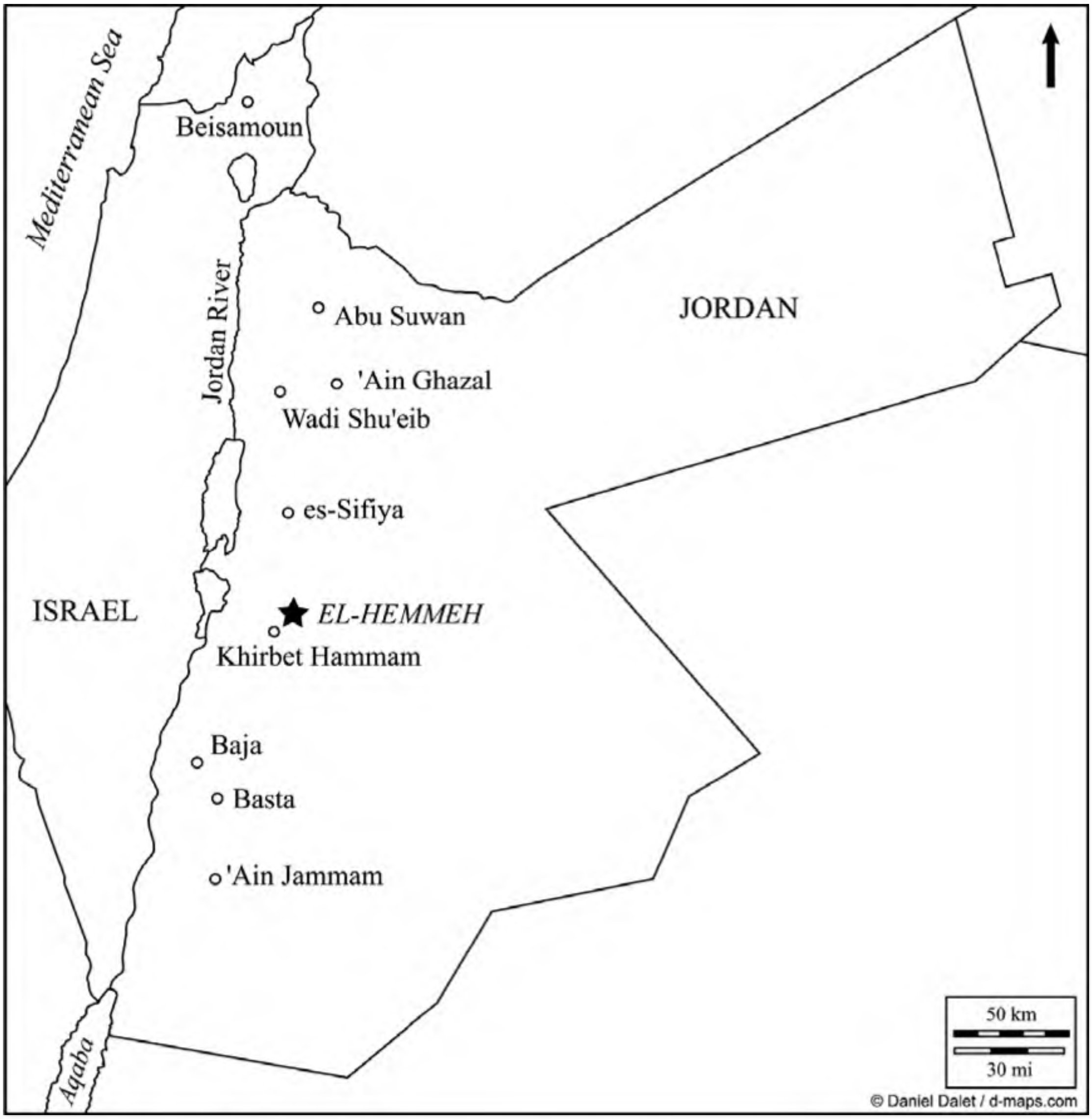

Fig. 1. Map of the Late PPNB sites mentioned in the text (outline map provided by http://d-maps.com/carte.php?lib=jordan_map&num_car=369&lang=en, accessed August 31, 2012).

Peopling the Pre-Pottery Neolithic: Social Perspectives on Food Production

Several recent archaeological studies have begun to go beyond the formulaic approach to plants and other foodstuffs in the Neolithic as little more than subsistence or economic staples (Atalay and Hastorf 2006; Twiss 2007, 2008; Wright 2000). These studies have advanced our thinking about household production, consumption, and economy by approaching foodways through various archaeological methods, including zooarchaeology and analyses of food-processing artifacts to consider the social organization and physical activities involved in PPNB subsistence. Wright's (2000) seminal work concerning ground-stone artifacts and related features used in food processing and consumption provides solid evidence that the household was the level at which the Late PPNB economy primarily functioned. Domestic consumption would have included individuals as household members and offered day-to-day affirmation of this membership (Twiss 2007: 61). Evidence for larger, inter-household feasting events during the Neolithic—primarily centered on large animals such as cattle—has also been discussed at length (Halstead 2004; Robb 2007; Twiss 2007, 2008) and highlighted the role of meat in negotiating relationships between households and the extended community.

In contrast to large-scale periodic feasting events, the routine tasks associated with day-to-day processing and consumption of (mostly) plant-based foods at the household level have recently been explored by Atalay and Hastorf (2006) at the Neolithic site of Catalhöyük. In examining the archaeological evidence for food preparation and consumption, a suite of daily activities was visible within the context of the seasonal cycle of local plant and animal resource availability. Most of the tasks discussed by the authors, such as grain-grinding, butchery, and baking, took place on or near the site and primarily within the house itself. Our aim in this chapter is to investigate the off-site processes that precede these activities and explore the organization of Neolithic farming activities within the framework of the agricultural cycle. A study of this kind is made possible by the modern ethnographic work conducted by Palmer (1998, 2002) in Jordan, which details the traditional agricultural cycle of the region, and by multiple studies of the activities associated with cereal production around the world (D'Andrea and Haile 2002; Hillman 1984; Nigusse 2005; Peña-Chocarro 1999).

Cultivation as Craft: A New Look at the Agricultural Cycle

Building on the intellectual foundations laid by these recent developments in Neolithic household archaeology, our intention is to incorporate a sociotechnical perspective to demonstrate that agriculture is much more than simply a mode of production or means of subsistence (cf. Pfaffenberger 1992). If we briefly reconsider the anthropological definition of the household established at the beginning of this essay, we can discern in the basic suite of cultivation-related practices several overlapping spheres of activity, including production, transmission, and reproduction. Certainly, the productive aspects of agriculture are self-evident and to date have dominated scholarly attention. To this we can add that transmission, too, very likely played a role in Neolithic farming traditions, through the potential development of land ownership and inheritance customs. Additionally, agricultural transmission would have taken a less tangible form in the passing on of specific knowledge and skills pertaining to land, local plant resources, and methods of working with these elements effectively and respectfully; as Marten and Saltman (1986: 43) note of contemporary farming societies, "traditional knowledge extends to all ways that farmers perceive and conceptualize the structure and function of their agroecosystems." This process could equally be described as socialization or social reproduction, wherein traditions and identities are created and sustained as children work alongside older family members learning to till, plant, and harvest.

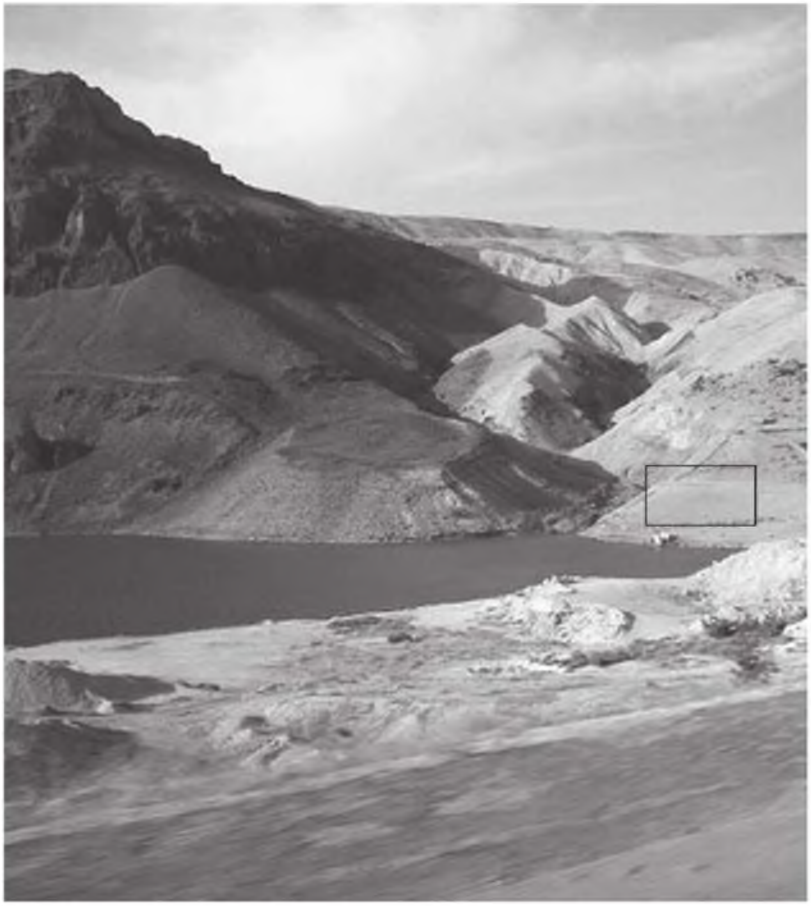

Fig. 2. View of el-Hemmeh from the south, across the Wadi el-Hasa, with the site location marked by square (photo, C. White).

It is in this necessarily intimate relationship between families, the earth, and their crops that we see a form of productive process described by Julia Hendon as craft, involving skill, flexibility, choice, and knowledge "accumulated over time, often through non-verbal experiential and observational learning, embedded in a social context" (Hendon 2006: 355). The advantage of this approach is that it allows us to consider standard aspects of production that remain little understood in the Late PPNB (e.g., techniques of production, timing and scheduling, control of labor or resources) but move beyond these facets to address also the significance of the process itself to those who make its practice an integral part of their lives (Hendon 2006: 372). In this way, we can begin to employ the available evidence imaginatively, as advocated by Ruth Tringham (1991: 102) in her landmark chapter, to evince a richer awareness of daily life and the social relations that constituted the Neolithic household. To this end, we offer the case study below, loosely in the form of a *chaîne opératoire*, which follows the seasonal progression of decisions and practices involved in cereal cultivation at the Late PPNB site of el-Hemmeh, Jordan.

The Setting: el-Hemmeh

Excavations at the site of el-Hemmeh, situated on a terrace overlooking the floodplain of the Wadi el-Hasa, have been conducted since 2004. The site is situated above a small perennial spring just east of a large basalt outcrop that dominates

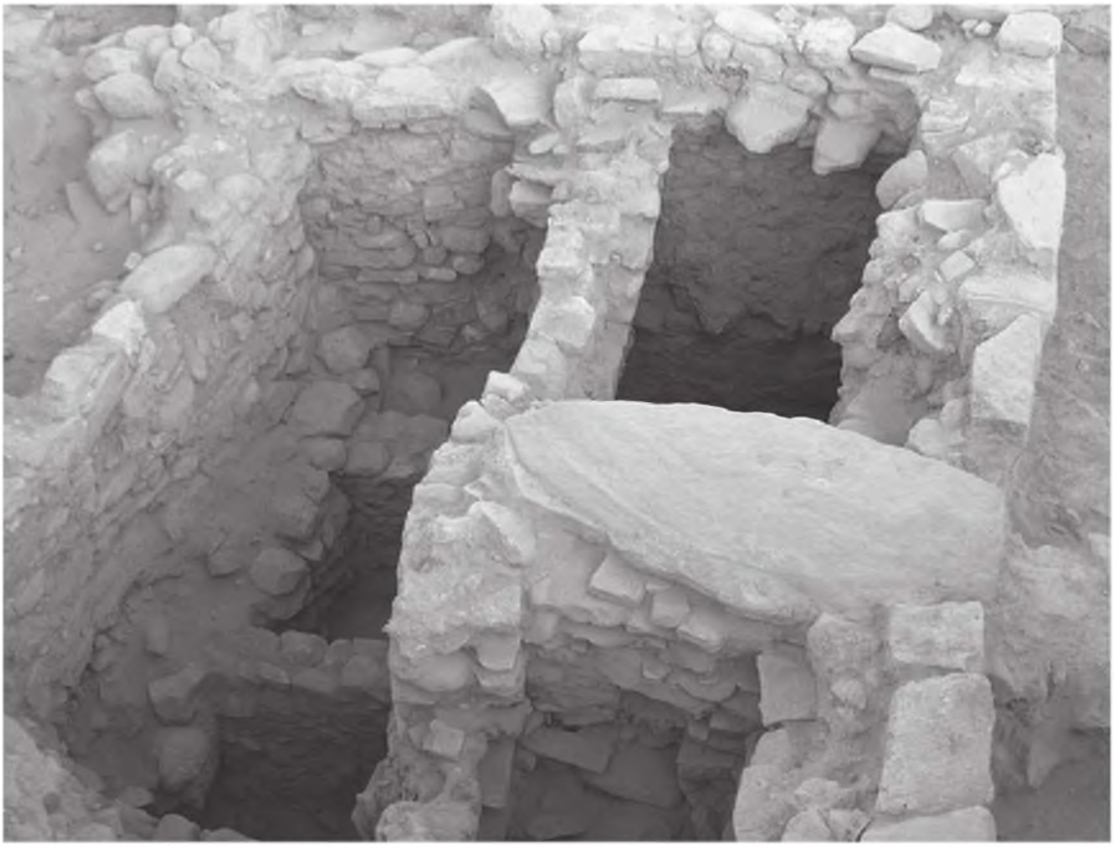

Fig. 3. Excavated architecture from el-Hemmeh showing semi-subterranean rooms (photo, C. White).

the local landscape (fig. 2). During four field seasons, excavations uncovered more than 300 square meters of Pre-Pottery Neolithic architecture dating primarily to the PPNA, Late PPNB, and PPNC Periods (Makarewicz et al. 2006: 215). During the Late PPNB, el-Hemmeh reached a size of at least 2 ha, although it is not yet clear whether all excavated architectural spaces were occupied contemporaneously. The crowded, multistorey architecture bears a striking resemblance to other contemporary settlements in the region, although el-Hemmeh is much smaller in scale than the larger sites found elsewhere in the southern Levant. Excavations have revealed an open area tentatively identified as a courtyard, surrounded by a network of dense, frequently remodeled rooms (fig. 3). Many walls were preserved to more than 2 m in height and appear to have supported at least one additional storey (evidenced in one room by a set of stone steps leading to an upper storey) although it is primarily the (semi-?) subterranean rooms that have survived to the present. Rooms were accessed from above or through small window passages, similar to the half-door entrances described by Kuijt (2008: 306) at sites such as Basta and es-Sifiya.

Carbonized macrobotanical remains were collected at el-Hemmeh using the "pinch" method in which sediment was gathered from multiple locations within a single 5–10 cm contextual stratum of a 1 × 1 m excavation unit (Pearsall 2000: 69). Sampled loci included high priority contexts such as hearths, storage areas, floor overburden, burials, and the courtyard area, as well as secondary midden deposits and subfloor channel contents. The sediment samples ranged in size from 2 to 32 L, with an average size of 9.28 L.[3] Samples were processed using standard flotation procedures and a manual hand-pump flotation tank.[4] Light fraction was collected using a fine mesh with a 250-micron aperture size and was subsequently transferred to the Paleoethnobotany Laboratory at Boston University for microscopic analysis. Samples were then weighed and subdivided using geological sieves of 2, 1, and 0.5 mm and examined with a Leica stereozoom microscope at magnifications of 10× to 30×. Carbonized plant material was identified using the botanical reference collection housed in the laboratory and in consultation with appropriate reference literature.

Field Location

The landscape of the Wadi al-Hasa, where el-Hemmeh is located, is a varied area both topographically and geologically, consisting of a high plateau, steep hill slopes, terraces, and wadi bottom. Fields of present-day cereal cultivation, which consist primarily of two-row barley and durum wheat, are located on the Karak Plateau above the site, where rainfall is more plentiful and temperatures are on average cooler than in the wadi (Al-Eisawi 1985; Zohary 1962). Smaller agricultural fields are also located on the narrow floodplain of the wadi floor, where tomatoes are grown annually with the aid of modern irrigation methods. The climatic conditions of the early Holocene were likely roughly similar to today's, with perhaps an increase of 50 to 100 mm of rainfall per annum (Cordova 2007; Neef 2004: 297; White 2012). However, overgrazing in late antiquity and modern times has led to a vast amount of slope erosion and the subsequent elimination of much local vegetation. The question of where el-Hemmeh's ancient "fields" might have been located within this landscape is therefore difficult to answer, given the complex geomorphological changes of the Wadi al-Hasa over the past 8,000 years (Hill 2006; Schuldenrein 1994).

In discussing the idea of agricultural fields in the Late PPNB, it might at first seem more appropriate to refer to these localities as areas of intensive plant cultivation and exploitation. However, given their circumscribed area and seasonal maintenance at el-Hemmeh, perhaps the idea of a "field" is not so far off the mark. It is likely that villagers cultivated stands of cereals on the alluvial fans along the wadi floor, a location visible from el-Hemmeh and easily accessible by a half hour's walk down-slope. A location of this sort is noted by Banning (1986: 39) as suitable for barley cultivation in the Wadi al-Hasa and also accords well with Bar-Yosef and Kislev's (1989: 635) statement that "cultivation [in the PPNB] was based on sowing on alluvial fans and terraces [. . .] where the water table was also high and the soil was fertilized by silt deposited by periodic floods" (as cited in Colledge 2001: 23). It is likely that annual spring floods in the Wadi al-Hasa replenished soil nutrients in the fields, which, as we argue later, were places of constant cereal production during the Late PPNB. It is important to keep in mind also the degree to which field location would have been an integral part of a local landscape laden with differential meaning and accessibility, because land tenure and land use would likely have defined the immediate territory in social terms. Among the Bontok of the Philippines, for example, forest resources are considered communal and unrestricted, access to swidden plots is typically controlled by ancestral corporate groups, and irrigated rice fields are the domain of individual households (Prill-Britt 1986). Although this case clearly cannot be applied directly to the Late PPNB, el-Hemmeh's location between diverse ecological zones—combined with the longevity of land use at the site—could well suggest the development of a comparable set of meaningful categories within the immediate countryside.

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[3] During the 2004–7 excavations, 223 flotation samples were collected and processed in the field by one of the authors (CW). The analysis of the samples is on-going and comprises the dissertation research of CW (White 2012). The evidence discussed here represents the preliminary results of this work based on the analysis of 30 samples chosen from high priority, well-provenienced contexts at el-Hemmeh (see also Makarewicz et al. 2006: 201–4).

[4] For a more detailed discussion, see Shelton and White 2010.

Crop Selection

Microscopic examination of the carbonized plant remains at el-Hemmeh indicates that cereals are well-preserved and abundant throughout the Late PPNB deposits. The most frequent species include two-row hulled barley and emmer wheat, with assemblages typically containing grains, glume fragments, and glume bases/spikelet forks. A few grains of what appears to be free-threshing wheat (*Triticum aestivum* L./*durum* Desf.) and perhaps even einkorn (*Triticum monococcum* L.) have also been recovered, consistent with the botanical assemblage at Late PPNB Basta (Neef 2004: 205). Domesticated legume crops at el-Hemmeh include *Vicia ervilia* L. and *Lens culinaris* Medik. Wild plant foods include fig and pistachio (e.g., *Ficus* sp., *Pistacia* cf. *atlantica* Desf.), along with crop weeds (e.g., *Lolium* sp., cf. *Bromus* sp., *Avena* sp., and *Malva* sp.), many species of wild legumes (e.g., *Astragalus* sp., *Melilotus* sp., *Trigonella* sp.), and other wild seed types (e.g., cf. *Coriandrum* sp., *Ajuga* cf. *chia* L., Asteraceae-type, cf. Solanaceae) (see also Makarewicz et al. 2006: 201–4).

The most ubiquitous crop taxa recovered at el-Hemmeh are barley and emmer wheat remains. These two cereal species, particularly barley, provide the bulk of evidence for the cultivation practices discussed in the following pages. While the emmer wheat identified is clearly a domestic form possessing a rough abscission scar (Colledge 1994, 2001; Willcox 2004), the evidence suggests that barley was not a fully domesticated species in the Late PPNB. This is because half of the spikelet forks possess a "wild" morphology exhibiting a clean abscission scar (fig. 4). However, the situation is complicated by the fact that some domestic traits are present in the barley—namely the presence of large, plump grains that do not occur naturally in the wild and that are within the size range of domesticated barley grains detailed by Colledge (2001: 94–95) (see fig. 5). It appears as though the barley at el-Hemmeh was in a state of "predomestication" (Hillman and Davies 1999)—a plant that retains some wild characteristics while being actively cultivated by humans.

Predomesticated barley has been identified at a number of PPNA and early PPNB sites in the southern Levant (Colledge 2001; Kislev 1989; Meadows 2005), particularly along the Jordan Valley/Dead Sea escarpment. This is generally considered the first morphological evidence of intensive cereal cultivation, although the specific mechanisms behind this transitional stage are still under discussion (Hillman and Davies 1999; Willcox 2005). Although predomestication cultivation has typically been viewed as an anomaly of the PPNA, an examination of Late PPNB archaeobotanical reports reveal that, at Beidha, hundreds of grain impressions suggest a "cultivated wild barley" (Helbaek 1966: 62). A similar situation occurs at Basta and ʿAin

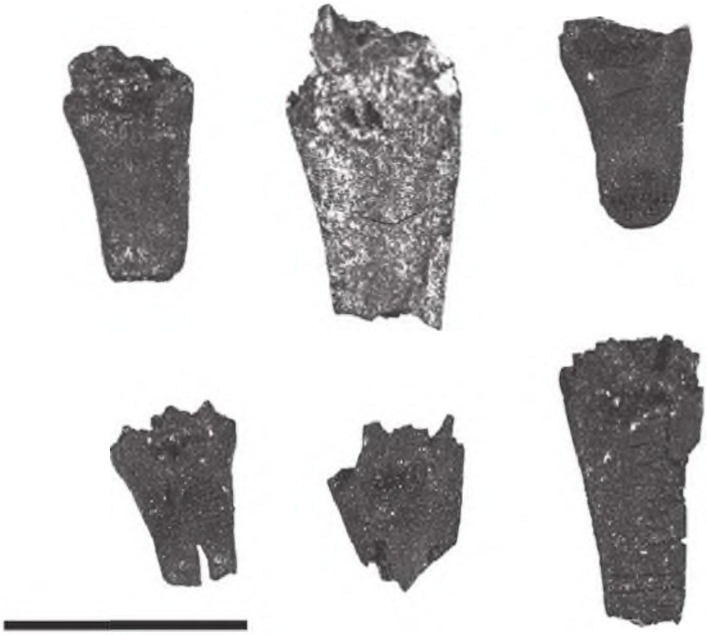

Fig. 4. Wild-type barley spikelet forks from Late PPNB deposits at el-Hemmeh (Scale = 2 mm).

Ghazal, where Neef (1997: 97; 2004: 204) notes the presence of domestic-sized two-row barley grains and brittle rachis internodes possessing an intact articulation scar.

In considering the organization of agricultural tasks as creative forces in the production of Neolithic society, the cultivation of barley provides an ideal case study. It is the most frequently recovered crop at Late PPNB sites in the southern Levant and the most ubiquitous across these sites. Palmer (2002: 192) notes that, until recently in southern Jordan, bread was typically made from barley flour and that farmers "paid their taxes in wheat, but ate barley." The fact that barley at el-Hemmeh and other contemporary sites was in a state of predomestication suggests that the timing of labor, harvesting strategy, and field maintenance techniques utilized did not actively initiate the domestication process by selecting for a nonshattering rachis. This information, coupled with the agricultural experiments carried out by Hillman and Davies (1999) and recent ethnographic work in the region (Palmer 1998, 2002), provides us with critical parameters concerning the possible ways barley might have been cultivated during the Late PPNB.

Cultivation Practices

1. Field Preparation

What kind of (and how much) activity was involved in the preparation of Late PPNB cereal fields? At least initially, farmers would have needed to clear the land of trees and underbrush. According to Peterson (2002), men and women show similar evidence of repetitive movement in their osteological markers during the Pre-Pottery Neolithic, although it is possible that these patterns were created through different activities. Based on an examination of muscle attachments in five male Neolithic skeletons, she suggests that these members of the community likely participated in land clearance activities, as well as repetitive tasks such as tilling of the fields (Peter-

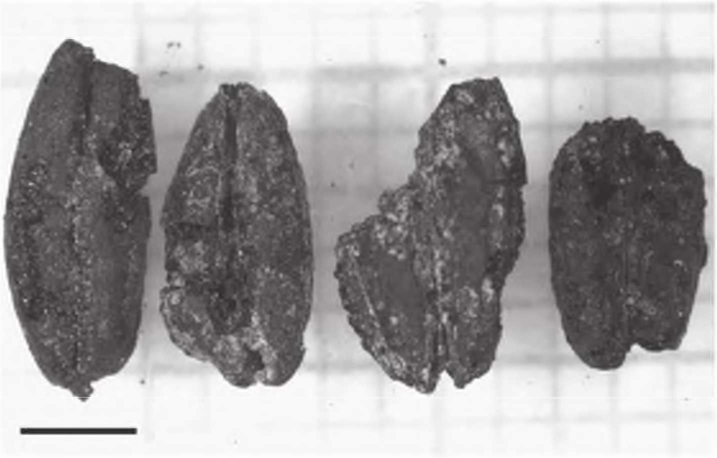

Fig. 5. Plump, domestic-type barley grains from Late PPNB deposits at el-Hemmeh (Scale = 2 mm).

son 2002: 110–11). The activity of tilling, repeatedly striking the soil with a hoe or adze to prepare the surface for seed planting, is also suggested in the archaeological evidence from the PPNB sites of Tell Halula in Syria and Beidha in Jordan (Ibanez et al. 1998: 142). At these sites, microscopic analysis of worked limestone and bone artifacts indicates that farmers used these tools as hoe-type implements to till the soil. Tillage is a necessary activity in fields that are planted year after year, since it helps increase the productivity of the soil. When fields are tilled after the winter seed has already been sown, this action helps to bury the seeds and protect them from predators (Palmer 1998).

The likelihood of tillage activities at el-Hemmeh is also evidenced by an abundance of crop weeds in the examined archaeobotanical samples from the site. Weed species include *Lolium, Galium, Malva,* and small legumes including *Trigonella, Melilotis*, and *Astragalus*. These weeds succeed in the soils disturbed by tillage and constant field use and serve to modify the vegetational composition of the local ecosystem (Colledge 1994: 60). Many of these plant species are defined as obligatory weeds, or eu-segetals, which are confined solely to cultivated fields. These weeds have lost their primary habitats over thousands of years of crop cultivation (Zohary 1962: 219). Other weeds are more ambiguous and inhabit both cultivated fields and other areas of disturbed soils, such as midden dumps and the edges of paths. The abundance of weed species at el-Hemmeh suggests that, in addition to tilling activities, village residents may sometimes have found it necessary to weed their barley plots so that the crop was not overtaken by weeds. Cereal fields in modern northern Jordan are still frequently weeded by hand, usually between January and March, to reduce the weed populations after the rains (Palmer 1998). Farmers might also have reduced the presence of weeds by growing a barley-wheat mixture (typically 75 percent barley and 25 percent wheat), as is commonly done in Eritrea today to decrease weed biomass (Nigusse 2005: 36).

The organization of agricultural practices at the household level raises the possibility of a continuity in field "ownership" through the years, perhaps by family affiliation or ancestry, as generations of family members returned to cultivate the same areas. Modern cultivation experiments by Hillman and Davies (1999) have shown that cereal harvests containing a high yield of predomesticated grains occur only when the same fields are reused year after year. These predomesticated plants, which possess a "wild" rachis, are capable of reproducing on their own without the aid of a farmer. Thus, regardless of whether farmers sowed the field with part of the previous year's harvest, the predomesticated barley population would have been able to reproduce naturally in the fields year after year. At el-Hemmeh, we can see this pattern in the high percentage of predomesticated grains present through all of the Late PPNB deposits at the site, as well as the large number of morphologically wild rachis fragments. This suggests that villagers were cultivating barley fields annually, year after year, without fallowing.

It is worth remembering that, even where household ownership of land and agricultural produce are the norm, as is suggested by food storage practices in the PPNB, labor may still have been organized at varying levels from the individual to the community at large. In many traditional rice-farming societies in Southeast Asia, for example, corporate work groups form annually to carry out the more intensive agricultural tasks such as field clearance, weeding, and harvesting on purely reciprocal grounds (Prill-Britt 1986; Visser 1989: 58). Beyond ensuring that adequate help is available to carry out these critical tasks, these groups constitute an important social mechanism that promotes community integration while maintaining the underlying centrality of the household.

2. Planting/Sowing

For winter crops such as domestic barley, seed-sowing could have taken place sometime in the late fall, probably in conjunction with tilling (fig. 6). These activities are symbolically significant tasks in many modern nonindustrial farming communities and often embody ideas of fertility, reproduction, and the continuation of the household itself (e.g., Palmer 1998: 144; du Boulay 1994: 32–33; Pionetti 2005: 131; Visser 1989: 56–88). While the possible symbolic implications of barley cultivation at el-Hemmeh are unknown, the evidence for tilling and continuous field use suggests that barley-sowing may well have carried special significance in the cultivation cycle. In thinking about the traditions associated with Neolithic field-sowing and the seeds themselves, it is also essential to consider the symbolic importance of the actual "heirloom" seed-types that were sown or regrown year after year. It is likely that the plump, predomesticated barley grains represented something distinct from the wild plants available locally and embodied a connection with generations of past farmer-ancestors. A reliance on local varieties, which farmers know intimately, is often a sense of pride and tradition, as is the case with at least 11 local barley landraces cultivated in Eritrea today (Nigusse 2005). The fact that the Neolithic form of cultivated barley existed in the southern Levant for thousands of years during the Pre-Pottery Neolithic attests to the longevity and conservatism of cultivation practices in this region and raises the possibility that families may have recognized and consciously perpetuated this connection to their past.

3. Harvesting Time

The harvest is one of the most important events of the agricultural cycle and often brings together individuals, families, extended families, and communities for activities in the fields and subsequent crop processing. Despite the significance of this period—both in terms of securing food resources and their cultural and symbolic implications—the physical location of the harvest as an off-site activity has excluded

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
Tilling	▨	▨	▨									
Sowing	▨ ??	▨ ??										
Weeding			▨	▨	▨							
Harvesting							▨	▨				
Drying/Roasting							▨	▨	▨	▨		
Field Grazing							▨ ??	▨ ??	▨ ??	▨ ??		

Fig. 6. Proposed calendar for agricultural activities in the Late PPNB (adapted from Palmer 1998: 145).

it from many discussions of Neolithic life. The household focus on agricultural practices in the Late PPNB necessitates an inquiry into how participants might have organized and carried out the barley harvest and how the techniques and technologies utilized might have been viewed by farmers as part of their traditions of agricultural production.

The morphology of the barley rachis internodes from el-Hemmeh indicate that half of the spikelets are a predomesticated "wild"-rachised type—and thus would have naturally dispersed when fully ripened—while the other half are domesticated (White 2012). Domesticated barley spikelets would have remained on the plant even after reaching maturity due to their hardy, indehiscent rachis. A mixed field/plot of predomestic and domestic plants at el-Hemmeh would have required a carefully timed harvest in order to minimize seed loss. One potential scenario for Neolithic cultivators was the harvesting of cereals *before they fully ripened*. An early harvest of immature spikelets would have efficiently maximized the number of grains collected per plant. A late harvest could have resulted in significant loss of predomestic barley, since many spikelets would have fallen to the ground upon ripening. The tradition of harvesting immature cereals is well attested ethnographically in Southwest Asia, and many bedouin and fellahin dishes are created from semi-ripe wheat and barley grains (Al Azm 2009; Palmer 2002). Farmers in Jordan frequently harvest immature wheat grains in a milk-ripe stage to prepare *frīka* (Palmer 1998).[5]

Lithic use-wear studies of sickle blade gloss have provided corroborating evidence for the harvesting of immature cereals during the Epipaleolithic and Neolithic periods (Unger-Hamilton 1985; Anderson 1991, 1998, 1999). The use of experimental sickles compared to Natufian blades from a variety of Epipaleolithic sites in the southern Levant has revealed that sickles were used to harvest stems in a green or semi-green state (Anderson 1991: 550). Furthermore, microscopic striations in the sickle gloss suggest that cereal stems were harvested close to the soil, allowing for the collection of straw along with the grain (Anderson 1991: 551–52). While the Natufian sickles analyzed in Anderson's study (1991) predate the archaeological deposits at el-Hemmeh, it is reasonable to consider whether a similar cereal-harvesting strategy might have been carried out during the Pre-Pottery Neolithic period.

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[5] Assessing the "ripeness" of cereal grains preserved at el-Hemmeh is difficult due to the effects of charring. Grains may swell when exposed to the process of carbonization (see Ferrio et al. 2004 for discussion). All measured barley grains from the Late PPNB deposits at el-Hemmeh fell within the cultivated size range.

Excavations have indeed revealed the presence of sickle blades with gloss from the Late PPNB deposits at el-Hemmeh (Makarewicz et al. 2006: 191).

Sickles have received much attention in the archaeological literature as a prehistoric harvesting tool and as a possible prerequisite to the domestication of cereals in Southwest Asia (Hillman and Davies 1999). In the case of mixed fields of predomestic and domestic barley, the use of sickles applied to immature plants would have (1) minimzed spikelet shed and (2) maximized yield per unit area (Hillman and Davies 1999: 90–91). This harvesting strategy would have been particularly useful if fields of barley were intentionally cultivated on alluvial fans and other moisture-rich areas in order to maximize grain yield where soil availability was limited.

Sickles are only one of myriad harvesting techniques that were potentially available to early cultivators. Other possible means of harvesting include basket-beating and ground collection of spikelets (see Kislev et al. 2004), both unlikely at el-Hemmeh, given that domestic spikelets would not have disarticulated and thus could not have been collected loosely. The use of wooden *mesorias* (see Peña-Chocarro 1999) is another possible technique, although straw could not have been collected alongside the grain. Modern cereal farmers in Jordan often use the straw as animal fodder, building material, and for many other uses. They frequently choose to hand-harvest cereals with a sickle (rather than using mechanized options) in order to cut the stems close to the soil and increase the collection of straw (Palmer 1998). In the case of small-scale harvesting with a sickle, two to four people working for five hours can harvest a cereal field measuring one *dunum*, approximately 1,000 m^2 (Palmer 1998: 150).

Neolithic cultivators may have made multiple passes through their fields to obtain immature barley grain, perhaps in the course of a number of days. We can imagine members of the household heading down the hill from el-Hemmeh, sickle in hand, to conduct a few hours of harvesting in the early mornings. We can imagine them spreading out and moving through the fields, checking on the development of the plants, skillfully bending and cutting cereal stems. The grains may have taken on a life of their own, embodying the success and economic security of the household as well as the development of younger generations.

The activity of sickle harvesting would have become part of the daily summer routine for at least some members of the community during a period of days and weeks. The methods and techniques used would have required detailed knowledge of species identification and recognizing when spikelets were beginning to ripen, which frequently happens at varying times, even within the same spike. A miscalculation by even a few days can result in the potential loss of large portions of the harvest. Children would have to be taught the proper technique of cutting the spikelets with minimum loss, as well as avoiding the contamination of crop weeds. But the activities of the barley harvest were not conducted in economic isolation; this cultivated crop was only one staple in the much larger picture of subsistence activities carried out during the agricultural cycle. In the weeks prior to the barley harvest, legumes such as bitter vetch and lentils would have been collected and, directly following the ripening of barley, emmer wheat would have been ready for harvesting (Palmer 1998: 145). It is entirely likely that, given the fully domesticated status of Late PPNB emmer at el-Hemmeh, wheat would have been harvested using a sickle as well, especially if wheat straw was desired (Bohrer 1972; Hillman and Davies

1999). If only the grain was needed, farmers could have used a small knife-tool to pop off the entire spike (Anderson 1999: 121). In this way, multiple cereal-harvesting methods could have been used during the Pre-Pottery Neolithic agricultural cycle, and the techniques associated with these various strategies would have required an intimate and extensive knowledge of local wild, cultivated, and domesticated species. Additionally, these activities were likely imbued with ideas of bounty, fertility, and tradition that served to cement them in place as the backbone of the PPNB household economy.

4. Post-Harvest Activities

The macrobotanical evidence from el-Hemmeh points to the presence of both predomestic and domestic barley, the former requiring far fewer post-harvest processing steps than the latter. When dried out, predomestic barley breaks into individual spikelets on its own (due to its "wild" rachis type), even when harvested while immature. Domestic barley, on the other hand, requires a suite of activities (i.e., threshing, winnowing) to detach the spikelets and separate the straw. Following the cereal harvest, cultivated fields probably were made available to local herds of domesticated sheep and goats. By consuming the post-harvest cereal stubble and weeds, as is practiced in Jordan today (Banning 1996; Palmer 1998), the animals provide fertilizer and replenish soil nutrients. By focusing primarily on agricultural production in this essay, we recognize that these activities represent only one piece of a much larger socioeconomic puzzle. Future studies of interconnecting agropastoral activities during the Late PPNB will prove especially useful.

After the harvest, spikelets of hulled barley at el-Hemmeh may have been stored whole, with minimal processing, but it is unlikely that they would have been directly transported from the field to the village. This is because the appropriate moisture content for grain harvesting (35%) differs considerably from that needed to safely store the grain (14%; Akar et al. 1999; Baldridge et al. 1985). If the moisture content is too high, species of fungus will develop and destroy the barley grains, producing mycotoxins that are dangerous to humans and animals. It is instead likely that the spikelets were dried in the sun or possibly parched or roasted before storage (Hillman 1981, 1984). While exposure to heat would have rendered the seed infertile and useless for the next year's planting, it would have extended its storage life—which may have been a major issue in the damp, subterranean cell-rooms of the Late PPNB. Additionally, the charring of spikelets would have removed the awns and greatly reduced the amount of space necessary to store the grain. If barley was indeed stored in the cramped basement rooms of el-Hemmeh, space may also have been a significant issue.

The flash-burning of hulled cereals was observed by one of the authors in Asturias, Spain (fig. 7) and provides an excellent idea of how this activity might have been carried out in the past. In a dry, protected area, small heaps of spikelets are lit on fire and begin smoking immediately, quickly rising to a flash-fire. The farmer uses her pitchfork to agitate the grain and sieve the spikes through the tines of the tool. The fire is carefully kept under control and ceases within minutes. Careful examination of the singed spikelets revealed that the hulled grain is completely uncharred, but the peripheral bits (such as the prickly awns) have been burned away. The grain can now be stored or immediately processed to remove the grain from its spikelet

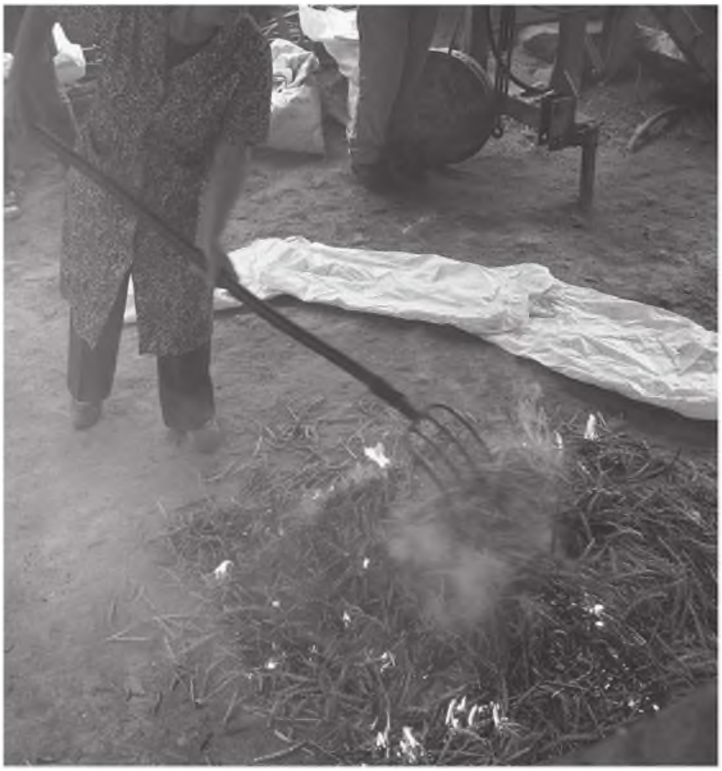

Fig. 7. Flash-burning of spelt wheat in Asturias, northern Spain (photo: C. White).

(Hillman 1981: 154). Whether spikelet-singeing took place in the Late PPNB is still unknown, but the existence of a strict suite of post-harvesting activities is likely. Through these activities, barley transitioned from a food source located physically outside the household to something accessible and available to household members, stored and processed at the very heart of the home.

Conclusion

Using macrobotanical evidence from the archaeological site of el-Hemmeh, this essay examined the sociotechnical aspects of activities associated with barley cultivation during the Late PPNB. Household archaeology provides a critical theoretical framework for studying aspects of labor coordination, decision-making, and techniques associated with cultivation, because it is at this level that economic tasks were most likely organized. Moving beyond the objects and spaces of the house itself, it is essential to keep in mind that household members would very likely have spent much of their time outside of the immediate confines of the settlement. We argue that annual activities of the agricultural cycle, particularly those related to barley production, involved the communication and transmission of a complex body of knowledge through generations as a form of household "craft" (*sensu* Hendon 2006). Using this concept, routine tasks such as working in the fields offer an opportunity to explore modes of social reproduction at the household level. Our investigations of barley cultivation at el-Hemmeh suggest that (1) fields were reused each year, without fallowing and without breaking new ground, (2) fields were tilled, possibly sown, and likely weeded, and (3) barley was harvested at an unripe stage, using a method such as sickle harvesting, and dried or roasted prior to storage. The predomesticated barley remains at el-Hemmeh and other contemporary sites implies the perpetuation of a specific set of agricultural techniques and is a tangible reminder of the traditions embodied in cultivation practices of the Late PPNB. Although our results in this chapter are admittedly preliminary, our approach offers several further points of consideration. First and foremost, agricultural practices—both plant cultivation and animal husbandry—do not exist as purely functional aspects of economic action but are inevitably embedded in a social context that generates and sustains the social worlds of traditional farmers, producing not only subsistence but power and meaning as well (Pfaffenberger 1992). Recognition of this crosscultural fact allows us to open avenues of significant interest in Neolithic household archaeology. An understanding of agriculture as part of a broader sociotechnical system includes the exploration of the practical concerns that we have addressed here while concurrently recognizing that the "the economy functions as a moral system" (Rival 2007: 73). In this short contribution, we have been able to do little more than make a stab at a holistic understanding, but during its writing, a range of pertinent, interrelated issues came to the fore that necessitate further exploration.

It is quite clear that a comprehensive review of ethnographic and historical research on agricultural practices, techniques, beliefs, and attitudes in traditional farming communities would result in a corpus of evocative "tools for thinking" that could dramatically shift current perspectives in the combined fields of archaeobotany and Neolithic archaeology. We suggest a number of specific themes, including the location of and interplay between "ritual" and "practical" concerns; concepts of time and temporal logic as they pertain to seasonality, crop cycles, and ceremonial calendars, from the daily task to the *longue durée*; the profound and enduring relationship between smallholders and their holdings; and the material agency of crops, fields, and associated farming equipment. Recognition that such matters comprise essential aspects of an agricultural life has special implications for Neolithic studies in Southwest Asia.

Although the defining characteristics of this watershed period in human history have often been framed in either economic or social terms, through the lens offered here, we suggest that these elements are in fact indissolubly linked and mutually reinforcing.

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Domestic Production and Subsistence in an Ubaid Household in Upper Mesopotamia

Bradley J. Parker

It was harvest season. Much of the grain was already processed and had been loaded into one of the storerooms and several of the smaller storage chambers on the side of the house. Winnowing was underway in the back yard, and a large pile of grain husks had accumulated against the back wall of the house. Several unfired clay basins and baskets of grain were spread out on the roof. The fire probably started in one of the storerooms. It quickly spread, igniting the wooden beams that supported the flat clay roof over the large central room of the house. The roof collapsed, crushing the wooden shelves, where tools, personal items, and beautifully painted vessels were stored. No one remembers how the fire started. No one tried to dig through the rubble. Only the storage cubicles in the lower yard that did not burn, probably because they had been sealed with reeds and mud, were emptied.

At the beginning of the 21st century, some 6,500 years later, members of the Upper Tigris Archaeological Research Project (UTARP) unearthed a significant portion of a burned house at the site of Kenan Tepe in what is today southeastern Anatolia (fig. 1). The excavation took place over several seasons. During the summers of 2001 and 2002, UTARP team members excavated an outside work surface and part of two small rooms in trench D5 (Parker et al. 2003; Parker and Dodd 2005). Additional remains of this structure were recovered during the 2004 and 2005 seasons, when excavations revealed two phases of cell rooms and a courtyard in trench D8 (Parker 2010; Parker et al. 2006, 2008). Then, during the summer of 2007, UTARP team members excavated a large central room and a number of smaller adjacent rooms belonging to this structure in trenches D4 and D6 (Parker et al. 2009). Although preliminary reports of these data have been published in a number of venues (Dodd et al. 2005; Parker 2010; Parker et al. 2003, 2006, 2008, 2009; Parker and Dodd 2005), we are only now in a position to begin a deeper synthesis and interpretation. To begin this process, this essay will examine modes of domestic production and subsistence of what I believe to be a single Ubaid Period household through the analysis of archaeological data from inside and around the above-mentioned structure.

The following analysis has two important implications. First, in the century and a half since its inception, scholars of the ancient Near Eastern have seen great breakthroughs in their understanding of some of the most important transitions in human history. As early as the 1940s, scholars such as Robert Braidwood focused research

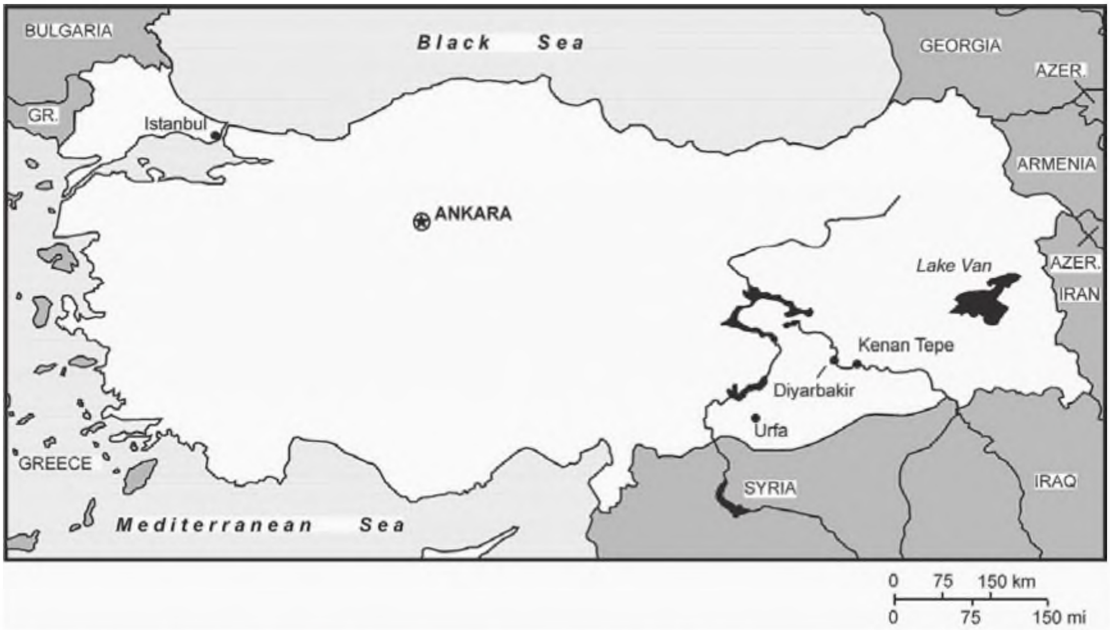

Fig. 1. Map of modern Turkey, showing the location of the site of Kenan Tepe.

on the advent of agriculture, which took place in the Near East between about 9,000 and 5,000 B.C.E. (Braidwood et al. 1983). Other scholars took up equally compelling theoretical issues such as urbanism, state formation, and the establishment of inter- and intraregional networks during the Uruk Period (ca. 4000–3000 B.C.E.; for recent treatments, see Rothman 2001 and Postgate 2002). The early introduction of Anthropological Archaeology to the study of the ancient Near East allowed the detailed examination of the processes behind these transitions and set the stage for a wave of theoretically sophisticated studies in ancient Near Eastern history. However, in an effort to explain these important transitions, scholars have largely overlooked the formative period between the Neolithic Revolution and the formation of the state in Near Eastern history. This period, between about 5000 and 4000 B.C.E., is known as the Ubaid Period. During this era, the advances in subsistence production achieved during the Neolithic were applied to a wide region, resulting in a shared material culture and a significant rise in social complexity (Henrickson and Thuesen 1989; Carter and Philip 2010). Since Ubaid material culture can be directly linked to the later urban phases of Near Eastern history (Oates 1960, 1983), it is clear that the developments taking place during this period provided the foundation for the formation of states in southern Mesopotamia and the interaction of these states with less-complex polities of the Mesopotamian periphery. The Ubaid Period has thus been called the "developmental bridge" between two eras of revolutionary change in human history (Henrickson and Thuesen 1989: 11–12). The first goal of this essay is, therefore, to explore how the substantial advances in subsistence production achieved during the Neolithic were applied during the subsequent Ubaid Period.

The second implication of this study is a matter of scale. The above-mentioned emphasis on macro-analysis has tended to underemphasize how interregional processes affected and were negotiated by people at the local level (Pollock 1992). In the search for generalized "big picture" models, studies may treat local communities as passive respondents in larger supraregional processes. The premise of this essay is that households are not passive respondents.[1] Instead, they are the loci of iterative actions where personal identities and economic, social, and ideological interests of family groups intersect with and shape the trajectory of communities, conditioning community participation in broader social processes. Material culture patterns are produced through, and are therefore a reflection of, dialectic interactions between local groups and larger regional processes. The second goal of this chapter is, therefore, to change the focus of analysis from the regional to the local. To do so, I will examine a single Ubaid Period household. By characterizing discrete patterns of ceramics, flora, fauna, lithics, and microdebris within and around a single architectural unit that formed the locus of household activities for a single prehistoric household, I will investigate patterns of subsistence and production at the household level. I will also explore the interface between the local and the regional in the formation of patterns of material culture.

Architecture

The house anchors the physical space within which members of the household perform their daily tasks (Blanton 1994; Sahlins 1976).[2] It is therefore appropriate to begin with a detailed discussion of the architecture and its surrounding spaces. The architectural unit examined in this chapter consisted of one large central room flanked by at least four smaller, narrow rooms forming a typical Ubaid tripartite plan (figs. 2 and 3; Roaf 1984). To the east and slightly downslope from this building were two phases of associated architecture consisting of a number of small cell rooms and two associated larger rooms (fig. 4; Parker 2010]). During excavation, this architectural complex was broken down into three structures. The upper area including the large central room and its adjoining side rooms was excavated as Ubaid Structure 4 while the neighboring group of rooms was excavated as Ubaid Structure 1 (the earliest phase) and Ubaid Structure 2 (the later phase). Three outside work areas were also associated with this building. The first was located to the south of the complex, the second to the north and the third on the east. For the purposes of this chapter, I will refer to this entire complex as the Burnt House. I will refer to the rooms within this complex by the room numbers listed on fig. 2.

At the heart of the Burnt House was a large central room (Room 1) measuring approximately 7 × 3 m (fig. 3A). Room 1 was flanked on the east by two smaller rooms: on the southeast, Room 2 measured approximately 4 × 1.5 m, and on the northeast, Room 3 measured approximately 2.5 × 1.8 m. To the north of Room 1 was a long, narrow chamber (Room 4) measuring approximately 1 × 3 m (fig. 2; Parker et al. 2009: 88–91]). The entrance to the Burnt House was located in the southern end of Room 2. A threshold connected Room 2 this to the large central room (Room 1). From Room 1, access to Room 3 was through a crawl-space resembling a low window (fig. 3B). No threshold was discovered linking Rooms 2 and 3, and

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[1] For a definition of "household," see Foster and Parker, this volume.

[2] According to Sahlins (1976: 36), the house, "functions as the medium by which a system of culture is realized as an order of action."

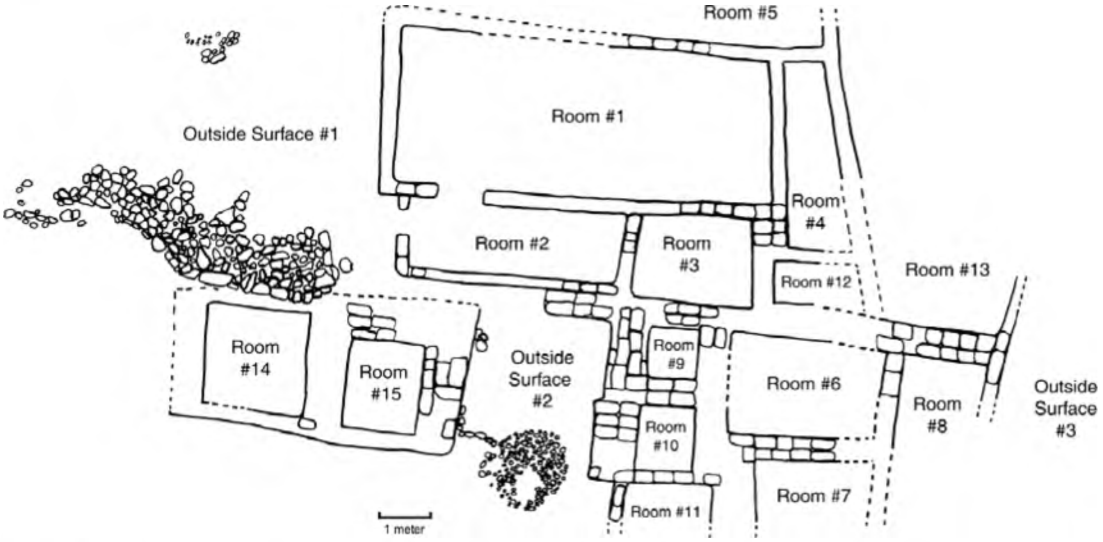

Fig. 2. Plan of the Ubaid period Burnt House from Kenan Tepe analyzed in this essay.

the wall separating these two rooms was not preserved high enough to determine if a crawl-space similar to that connecting Rooms 1 and 3 existed between Rooms 2 and 3. A small portion of what was perhaps a similar set of narrow rooms was probably located on the western side of the structure (Room 5). In spite of the fact that the western portion of this building remains unexcavated due to its depth within Kenan Tepe's main mound, it is nevertheless possible to estimate the overall size of the tripartite building. The total length of this structure from north to south was approximately 8.5 m. If we assume that the rooms on the western side of Room 1 were similar in size to those on the east, then this structure was likely 7 m in width (fig. 2; for parallels see Huot 1989, Jasim 1985, and Roaf 1989). Abutting the eastern side of the Burnt House were a number cubicles or cell rooms and one or more larger rooms (approximate room sizes are given in Table 1). These adjacent structures consisted of three cell rooms adjoining three slightly larger rooms (fig. 2). South of these rooms was a small courtyard and two more cell rooms (Parker 2010: figs 21.5 and 21.6).

Three outside spaces were associated with this architectural complex. Directly south of the tripartite building was a large open area containing parts of two hearths (outside surface #1). A stone retaining wall separated this space from the neighboring and slightly downslope Room 14. A second outdoor space (outside surface #2) was located between the two groups of small rooms (Rooms 9, 10, and 11 on the north and 14 and 15 on the south). Finally, an open area (outside surface #3) was excavated on the north side of these rooms (fig. 2).

Collapse layers excavated within Rooms 1 and 3 (discussed below) contained remains that allow a rare glimpse of roofing and roof construction in the Burnt House. The roof of this structure appears to have been constructed by first laying wooden beams between the walls of Room 1. Wet clay mixed with copious amounts of straw temper was then applied on top of these beams. Although the beams themselves burned in the conflagration that destroyed the structure, the same fire allowed the preservation of the clay applied on top of the roof beams. From this evidence

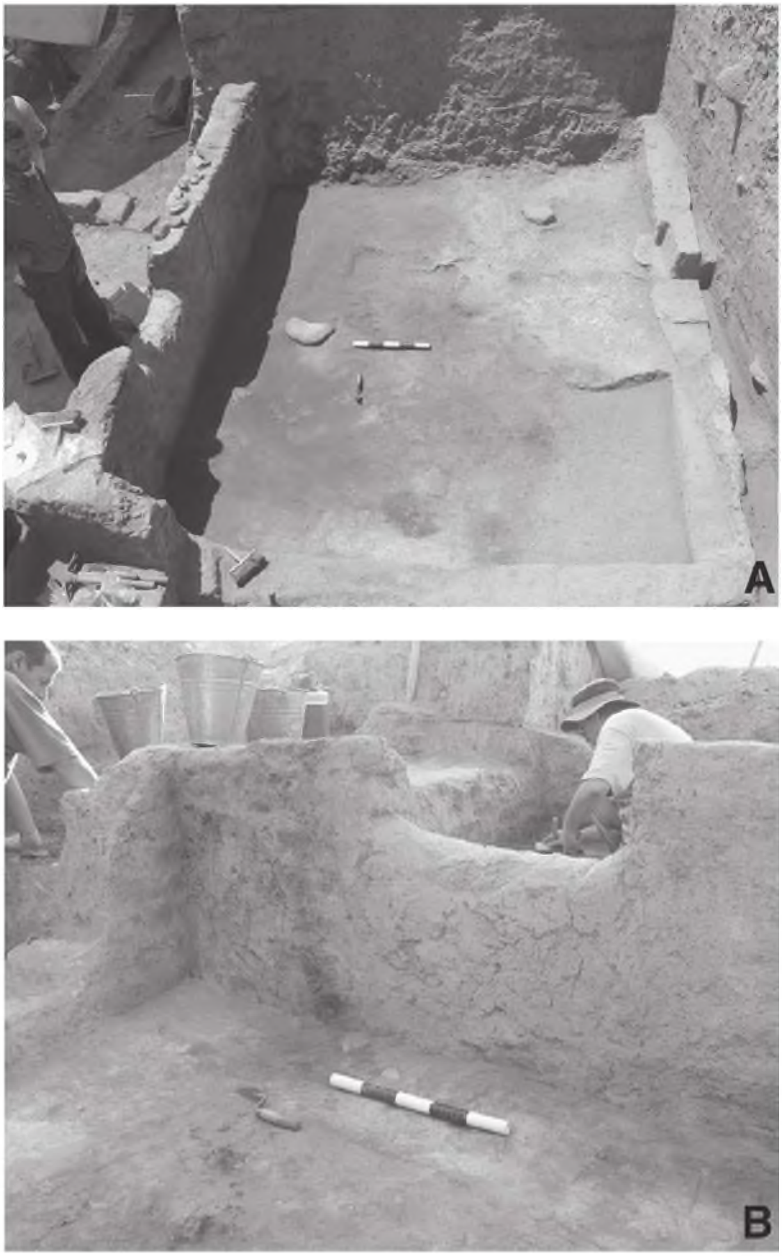

Fig. 3. A: View of the large central room (room #1) of the Burnt House after the roof collapse was removed. B: View of the crawl-space between the large central room (room #1) and a smaller side room (room #3) of the Burnt House.

we were able to gather the following information. The impressions of the wooden beams in the preserved clay suggest that the roof beams measured more than 20 cm in thickness. The roof beams must have been worked at least to some extent, since we found no evidence of branches, and the beam impressions were relatively straight and even. The roof beams were also laid relatively close together. In cases where measurements could be made, there was only a 5 to 10 cm gap between roof beam impressions in the overlying clay. There is also some evidence in the collapse layers to suggest that the roof beams were laid between the east and west interior walls of Room 1.

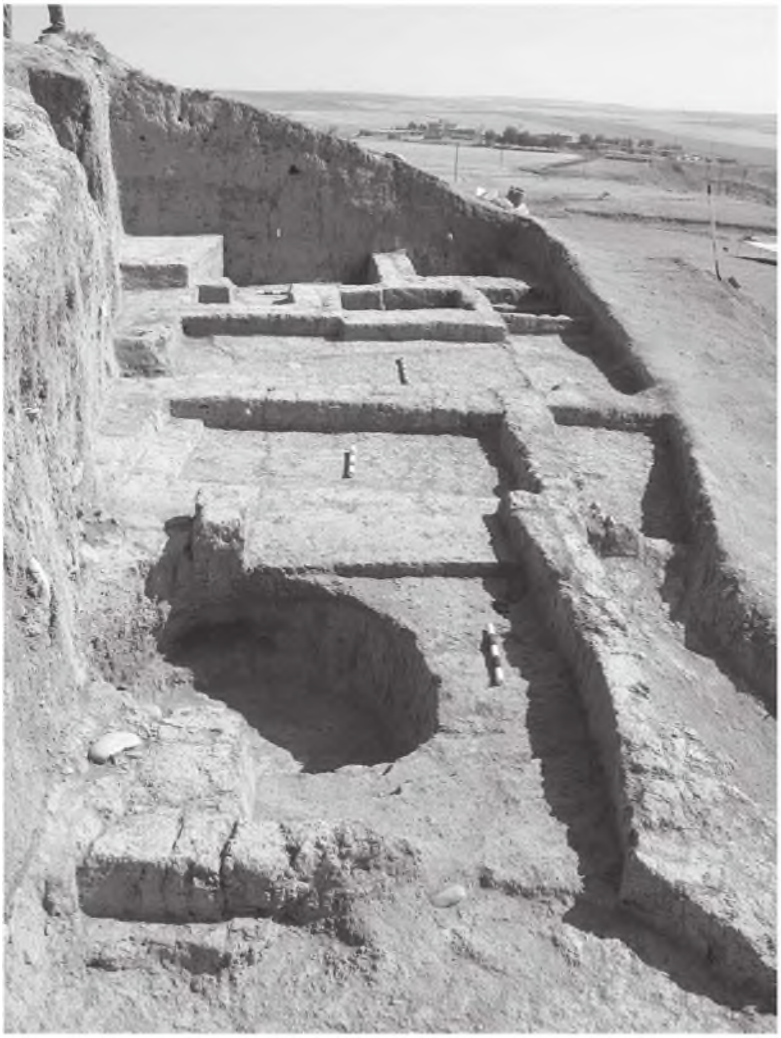

Fig. 4. View of cell rooms on the eastern side of the Burnt House. In the foreground are rooms #14 and #15. Outside surface #2 separates these rooms from rooms #9, #10, #6 and #7 in the background.

The fact that the top of the clay overlying the wooden roof beams did not bear impressions of further layers of roofing material suggests that this layer was allowed to dry before further steps were undertaken. Once the clay was dry, a thick layer of reeds was applied. I cannot say for certain the direction the reeds were laid. However, I assume they were laid perpendicular to the roof beams (i.e.; north-south). Another thick layer of clay made up the final step in the construction of the roof. The top of this layer, which in places was 30 cm thick, was smooth resembling in many ways the texture of the earthen floors of the house. The underside of preserved examples of this clay displayed impressions of the reed layer below (Parker et al. 2009: fig 5).

Dating

Copious carbon samples were collected from a variety of contexts in and around Kenan Tepe's Burnt House. Of these, four have so far been processed. Two carbon samples were taken from outside surface #3 just north of Room 8. A third comes from a fireplace on the same surface. The fourth sample comes from what I believe

Table 1. Size, contents, and suggested function of rooms in the Burnt House.

Room Number	Room Size	Contents on floor	Suggested Room Function
Room 1	7 × 3 m	numerous small finds, pottery, bone, lithics	habitation/ domestic activity
Room 2	4 × 1.5 m	numerous small finds, pottery, bone, lithics	habitation/domestic activity
Room 3	2.5 × 1.8	organic material, 2 small finds, pottery, bone, lithics	multiuse
Room 4	1.0 × 3.0 m	grain phytoliths	grain/fodder storage
Room 5	unknown	sunken pot	processed cereal storage?
Room 6	2 × 3 m	grinding stone, bead, pottery, bone , lithics	production/multiuse
Room 7	1.5 × ca. 3 m	grinding stone, grain phytoliths, pottery, bone, lithics	production/multiuse
Room 8	1 × 1m.	empty	uncertain
Room 9	1.0 × 0.7 m	grain phytoliths	grain/fodder storage
Room 10	1.0 × 1.4 m	empty	storage
Room 11	1.5 × ? m	grain phytoliths (human burial in foundations)	grain/fodder storage
Room 12	unknown	unknown	uncertain
Room 13	unknown	empty	grain/fodder storage
Room 14	2.5 × 1.5 m	unknown	storage
Room 15	2.5 × 1.5 m	empty	uncertain

to be a storage room. The two samples taken from outside surface #3 yielded 2-sigma calibrated dates of 4800–4660/4640–4620 B.C.E. (D.5.5142.7) and 4700–4480 B.C.E. (D.5.5142.8). The sample taken from the fireplace on outside surface #3 yielded 2-sigma calibrated dates of 4800–4665/4645–4615 B.C.E. (D.5.5080.5576; Parker and Dodd 2005: 72 and Table 1). The sample taken from the storage room yielded a 2-sigma calibrated date of 4700 to 4660 B.C.E. (Parker et al. 2008: 106). These dates fall relatively neatly in the middle of the fifth millennium, giving a maximum range for the end of the use life of Kenan Tepe's Burnt House between 4800 and 4480 B.C.E. (Parker 2010: fig 21.9). However, if we consider the overlap between the date ranges given by these four samples, we can narrow this range to only 40 years: from 4700 to 4660 B.C.E.

Room Function

From the day of their discovery, the small cell rooms (excavated as Ubaid Structure 1 and Ubaid Structure 2) presented a number of problems. Before the excavation of the tripartite house (Ubaid Structure 4), when our only architecture consisted of these two and one other cell-plan structure (Parker et al. 2008; Parker 2010), UTARP team members regularly debated what function these rooms served and how to reconstruct the architecture they represent. To aid in our interpretation of room function and use, a number of sampling strategies were employed. In this subsection, I will discuss the debris found in or on the floors of each of the rooms in the architectural complex described above. The goal of this analysis is to distinguish between interior activity areas and interior storage spaces. Further refinement of my interpretation of room use will be discussed in the microdebris analysis subsection.

Room 1, the large central room in the Burnt House, was clearly the heart of the architectural complex. The floor was comprised of smoothed, packed clay. A number of domestic artifacts were scattered across this floor including andirons, spindle whorls, bone awls, a bone needle, and three small axe-heads (Table 2). The archaeological data thus leave no doubt that Room 1 was a habitation and activity area. Room 2 was relatively free of artifacts. However, the fact that a threshold connects Room 2 to the exterior of the house and a second threshold gives access to Room 1 shows that Room 2 was also a habitation/activity area. Room 3 is more difficult to categorize. Although this is a relatively large space (2.5 × 1.8 m; see Table 1) with a floor similar in composition to those excavated in Rooms 1 and 2, botanical analysis of a large pile of ash filling the center of this room suggests that, at the time of the destruction, this room was filled with animal dung (Graham and Smith, this volume; Parker et al. 2009). I must therefore conclude that Room 3 was used, at least at times, for storage. Room 4, which is a narrow room on the northernmost end of the excavated portion of the Burnt House, contained evidence of grain pseudomorphs. The fact that these remains only formed a thin layer on the relatively uneven surface of the room suggests this room was either not filled at the time of the destruction of the house or that it was emptied shortly after. The fact that no domestic artifacts were excavated from this space supports the conclusion that the primary function of this room was grain or fodder storage. Only a tiny portion of the northeast corner of Room 5 was contained within the boundaries of our excavation unit, and thus it is impossible to say with any certainty what this room was used for. Nevertheless, excavation revealed a single ceramic vessel sunk into the floor of this room. The vessel, which measured 30 cm in maximum diameter, was partially filled with wheat grain. It was completely buried beneath the floor of Room 5 so that the lip of the jar was flush with the floor of the room. The presence of this pot is tantalizing, because it may suggest the presence of more sunken ceramic vessels in the unexcavated portions of this room.

Rooms 6 and 7 exhibit the characteristics of production or multiuse activity spaces. Both are relatively large (ca. 2 × 3 and 1.5 × 3 m, respectively; Table 1 and fig. 2), both contain hard-packed, relatively level clay surfaces, and both yielded parts of basalt grinding stones. Interestingly, the debris inside Room 7 also included patches of grain pseudomorphs. There are two possible explanations for this. First, it is possible that these rooms were used for storage. A second possibility is that these rooms, and possibly others (such as Room 3?), served multiple functions. These spaces may, for example, have been used for storage when there was a need for storing surpluses, while at other times, these spaces could have been used as production areas.

Room 8 was too badly disturbed by later construction to yield any data. Rooms 9, 10, and 11, which measured 1.0 × 0.7, 1.0 × 1.4, and 1.5 × 1.5 m, respectively, were likely too small to have been utilized as activity areas.[3] Room 9 contained ample evidence of grain storage in the form of thick layers of grain pseudomorphs. Room 10 was completely empty. Room 11 contained some grain pseudomorphs. In addition, a human burial was recovered below the floor of Room 11. An analysis of these remains supports the hypothesis that this was a secondary burial that was purposefully interred as a foundation deposit (Parker et al. 2008: 107, 131–32; Parker et al. 2009). Room 13 contained a hard clay floor. Unfortunately, no artifacts were recovered from this space that might allow further analysis, and only a portion of this room was contained within our excavation area. Rooms 14 and 15, which were located a few meters south of the complex of rooms just discussed, were also both quite small (2.5 × 1.5 and 2.5 × 1.7 m, respectively). Both Rooms 14 and 15 contained evidence of organic debris.

Combining room size with room contents thus leads to the following interpretation of room function in the Burnt House: Rooms 1 and 2 appear to have been habitation spaces and/or activity areas. My assumption is that much of the daily domestic activity of the inhabitants of the Burnt House was centered on these rooms. Rooms 6, 7, and perhaps 8 were also activity areas. The data from Rooms 6 and 7 suggest that many of the activities that took place there focused on cereal processing or other types of production. Rooms 4, 9, 10, 11, 14, and 15 were almost certainly used for storage. Room 3 appears to have been a multiuse space. Rooms 5 and 12 are indeterminate.

Ceramics

The elaborately painted ceramics that characterize the Ubaid Period have been the focus of considerable discussion over the past century. In spite of this, only a few researchers have sought a broader understanding of Ubaid assemblages by focusing on the quantification, rather than the qualification, of Ubaid ceramic data (see especially Akkermans 1988 and Schwartz 1988). During the summer of 2008, UTARP members conducted an attribute analysis of all ceramic sherds from secure Ubaid Period contexts (Parker and Kennedy 2010). This analysis included 15,215 sherds.[4] The following conclusions are drawn from an analysis of ceramics excavated from contexts associated with the Burnt House.

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[3] Note the parallel here with the small cubicle rooms discovered at Tell Adaba. Judging from the architecture and the material remains discovered in and around these rooms and citing ethnographic parallels, Jasim (1989: 84–85) concludes that this is the remains of a storage facility consisting of a number of small compartments that were covered by reeds and clay when full.

[4] I would like to thank Jason Kennedy for his assistance in compiling the data analyzed in this subsection. The methodology used in our ceramic attribute analysis is enumerated elsewhere (Parker and Kennedy 2010). For the purposes of this essay, I will only include the following short outline of our methodology: Bags from secure loci were first counted and weighed. Ceramics were then separated into three broad fabric categories: coarse, medium, and fine fabrics. Once separated into fabric types, ceramics were further divided into body sherds and rim sherds. For body sherds, we recorded the surface treatment, the presence or absence of decoration, decorative motif (on decorated sherds), the estimated vessel size, the presence or absence of sooting or carbonization (Skibo 1992), and the wall thickness of each sherd at its thickest point. We analyzed the rim sherds in a similar manner, recording the surface treatment and decoration, the presence or absence of sooting and carbonization, and sherd thickness (measured 1 cm below the rim). In addition, rims were classified into types, and rim diameters and percentages of preservation were calculated using a ceramic diameter chart. Bases and handles were recorded in a similar fashion.

Table 2. List of small finds from the Burnt House with find-spot and suggested function.

Artifact	Number	Location	Possible Function
Spindle Whorl	D.4.4112.7	Collapse layer in Room 1	Textile Production
Spindle Whorl	D.4.4112.29	Collapse layer in Room 1	Textile Production
Spindle Whorl	D.4.4112.41	Collapse layer in Room 1	Textile Production
Spindle Whorl	D.6.164.1	Collapse layer in Room 1	Textile Production
Spindle Whorl	D.4.41135.8	Floor in Room 1	Textile Production
Spindle Whorl	D..6.167.38	Floor in Room 1	Textile Production
Spindle Whorl	D.6.167.39	Floor in Room 1	Textile Production
Spindle Whorl	D.6.167.40	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.13	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.15	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.16	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.17	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.18	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.19	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194.20	Floor in Room 1	Textile Production
Spindle Whorl	D.6.194..22	Floor in Room 1	Textile Production
Spindle Whorl	D.6.186.5	Outside surface	Textile Production
Spindle Whorl	D.6.188.19	Outside surface	Textile Production
Spindle Whorl	D.6.178.19	Outside surface	Textile Production
Fishnet Weight	D.4.4112.50	Collapse layer in Room 1	Fishing
Fishnet weight	D.4.4113.57	Collapse layer in Room 1	Fishing
Bead	D.4.4122.17	Collapse layer in Room 3	ornamentation
Bead	D.6.167.5	Floor in Room 1	ornamentation
Bead	D.6.167.16	Floor in Room 1	ornamentation
Bead	D.6.16721	Floor in Room 1	ornamentation
Bead	D.6.167.22	Floor in Room 1	ornamentation
Bead	D.6.194.23	Floor in Room 1	ornamentation
Bead	D.6.194.27	Floor in Room 1	ornamentation
Pendant	D.6.194.21	Floor in Room 1	ornamentation
Pendant	D..6..167.46	Floor in Room 1	ornamentation
Pendant	D.6.194.25	Floor in Room 1	ornamentation
Bone Awl	D.4.4127.16	Floor in Room 5	Textile Production
Bone Awl	D.6.167.2	Floor in Room 1	Textile Production
Bone Awl	D.6.188.21	Outside Surface	Textile Production
Small Axehead	D.6.167.14	Floor in Room 1	Mixed Use
Small Axehead	D.6.167.19	Floor in Room 1	Mixed Use
Small Axehead	D..6.167.20	Floor in Room 1	Mixed Use

Coarse fabrics are most common on exterior surfaces around the Burnt House, where they constitute 42.61% of the assemblage. Fine wares are most frequently found on interior surfaces, where they constitute 30.11% of the assemblage. Fine wares are the least-common fabric type found on exterior surfaces, where they make up 19.31% of the assemblage. The most common ceramic fabric-type found in and around the Burnt House is our Ubaid medium fabric.[5] Medium fabric accounts for 38.39% of the ceramics found on interior surfaces, 38.26% of those found on exterior surfaces, and 49.58% of those recovered from the collapse layers within the Burnt House. The data show that a large majority (68.8%) of the medium-fabric body sherds belong to medium-sized vessels (ca. 16 to 30 cm diam.). Medium-fabric vessels are usually undecorated and very rarely show evidence of sooting. The majority of medium rim-sherds belong to globular jars. My assumption is that undecorated medium-sized jars were used for storage. However, this type of jar was clearly not meant to be completely stationary: even when full of liquid, medium jars could likely be moved by a single person. The practical implications of these data are obviously open to various interpretations. However, I suggest that medium-sized jars served the storage needs of households, since they allowed flexibility and mobility in an economy that emphasized the storage of multiple small amounts for periodic consumption.

Another interesting trend apparent in Kenan Tepe's Ubaid ceramic corpus is evident in the distribution of rim types. The corpus is dominated by open bowls, which make up 63.46% of the total assemblage. When vessel size and rim type are compared, it is apparent that open vessels are usually relatively small in size. These combined data suggest that among serving vessels there is an emphasis on individual, rather than communal, consumption. Interestingly, small open vessels made of fine fabrics and often painted tend to be concentrated on inside surfaces. This comes in stark contrast to the distribution of sooted rough fabrics that appear most often on exterior surfaces. These data suggest that cooking using rough-fabric cooking pots was carried out on outside surfaces and that food consumption using small open fine fabric vessels took place largely on inside surfaces (especially in Room 1).

Microarchaeological Data

Further refinement of theories about the use of space in the Burnt House can be gained through an examination of the microdebris. During the excavation of the Ubaid Period remains at Kenan Tepe, UTARP team members employed a sampling procedure known as the Household Archaeology Protocol (hereafter "HAP").[6] HAP sampling included collecting whole-earth samples from all surfaces in and around the Burnt House. It should be emphasized here that for the purposes of microarchaeological analysis, HAP samples were collected from the soil matrixes of floors. First, the surfaces themselves were completely cleaned to remove any overlying

[5] Three broad fabric categories were distinguished in Kenan Tepe's Ubaid ceramic corpus: coarse, medium, and fine fabrics. Coarse fabrics are characterized by large chaff and grit temper and often contain large grit inclusions. Coarse fabrics are frequently incompletely fired, grading to black at the core. Medium fabrics are composed of medium grit and some chaff temper. Ceramics composed of medium fabrics are often incompletely fired, exhibiting a black core. Many examples are chaff faced. Fine fabrics are characterized by well-levigated clay tempered with fine-to-very-fine grit. Ceramics composed of fine fabrics tend to be well fired, exhibiting an even color throughout. Ceramics composed of fine fabrics are often prone to over-firing, which results in a greenish color.

[6] For a discussion of this methodology, see Graham and Smith this volume, Foster 2009, Parker et al. 2009. Note that our sampling and analytical methods rely heavily on Rosen 1989 and Rainville 2005.

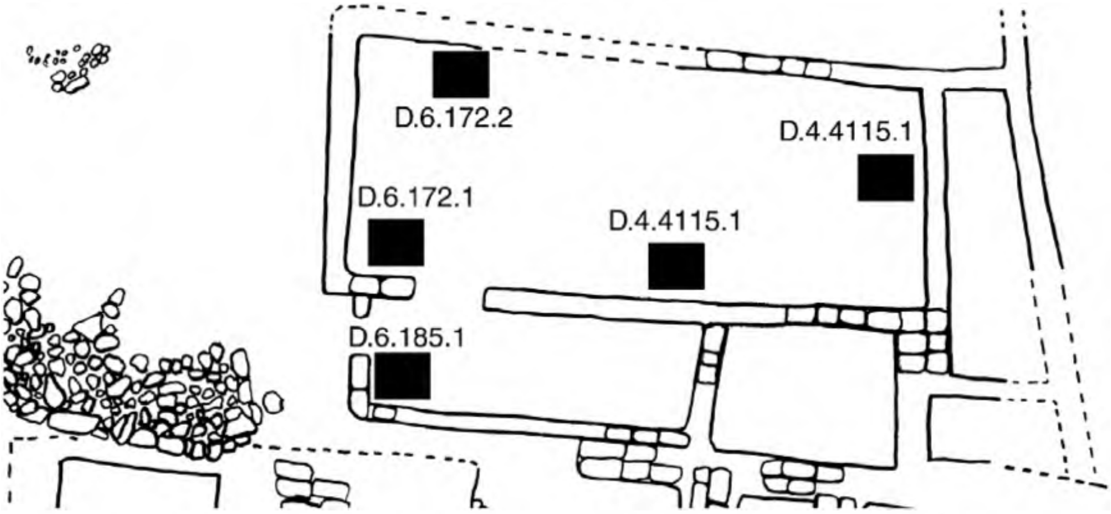
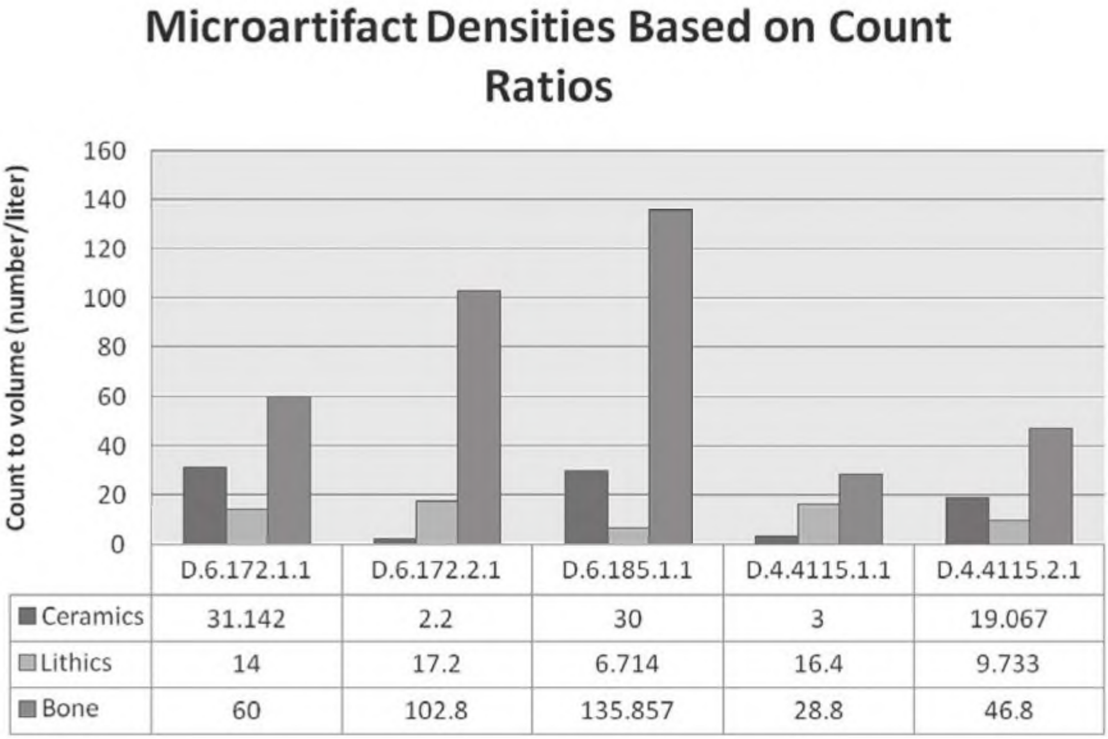


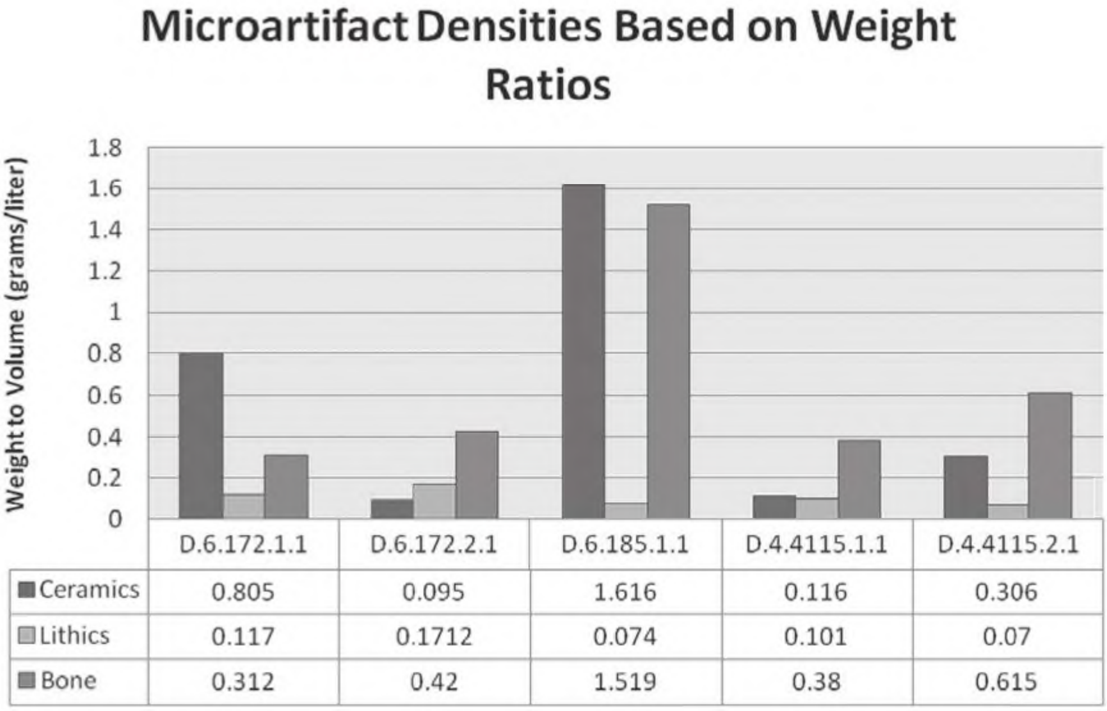
Fig. 5. Plan of the central portion of the Burnt House (rooms #1, #2, #3, #4 and #12) showing the location HAP samples.

debris. HAP samples were then extracted from the matrixes of the floors by laying out 50 × 50 cm squares in areas of surfaces deemed to be completely undisturbed. HAP samples were not screened but instead were collected *in toto*. Sample volumes were recorded before the samples were introduced to a Siraf-type flotation machine (Williams 1973). Heavy fraction from these samples was collected in a 1 mm mesh suspended in the flotation tank. Light fraction was extracted through an overflow trough using 1 and 0.25 mm meshes. Light fraction was subsequently sent to the University of Connecticut for botanical analysis, and the heavy fraction was exported to the University of Utah for microarchaeological analysis.

Five HAP samples were taken from the floors of Rooms 1 and 2 in the Burnt House (fig. 5). Considering the count and weight ratios of the three major artifact classes (ceramics, lithic, and bone), several trends are immediately visible. First, there is a clear accumulation of debris in the two samples from the corners closest to the door (D.6.185.1 and D.6.172.1; fig. 6). I suggest that this pattern may be indicative of a space that was habitually cleaned. As debris was swept out the door, higher densities of microartifacts accumulated in the corners closest to the door. Second, there is a contrast between the relatively low density of lithic debris and the relatively high density of bone debris. These trends are even more interesting when we look at subdivisions within these material categories. Fig. 7 shows that the relatively low ratio of lithic debris is made up almost exclusively of chert. Obsidian is practically absent from the samples. These data suggest that chert lithics were probably used to manipulate cooked food or perhaps to aid in textile processing. They also show that chert and obsidian tool manufacture or modification were not carried out in this location. I hypothesize that, because activities such as chert and obsidian tool manufacture or modification produce sharp, potentially hazardous, debris, these activities were discouraged in interior domestic spaces, especially those where people often congregated and children were likely present.

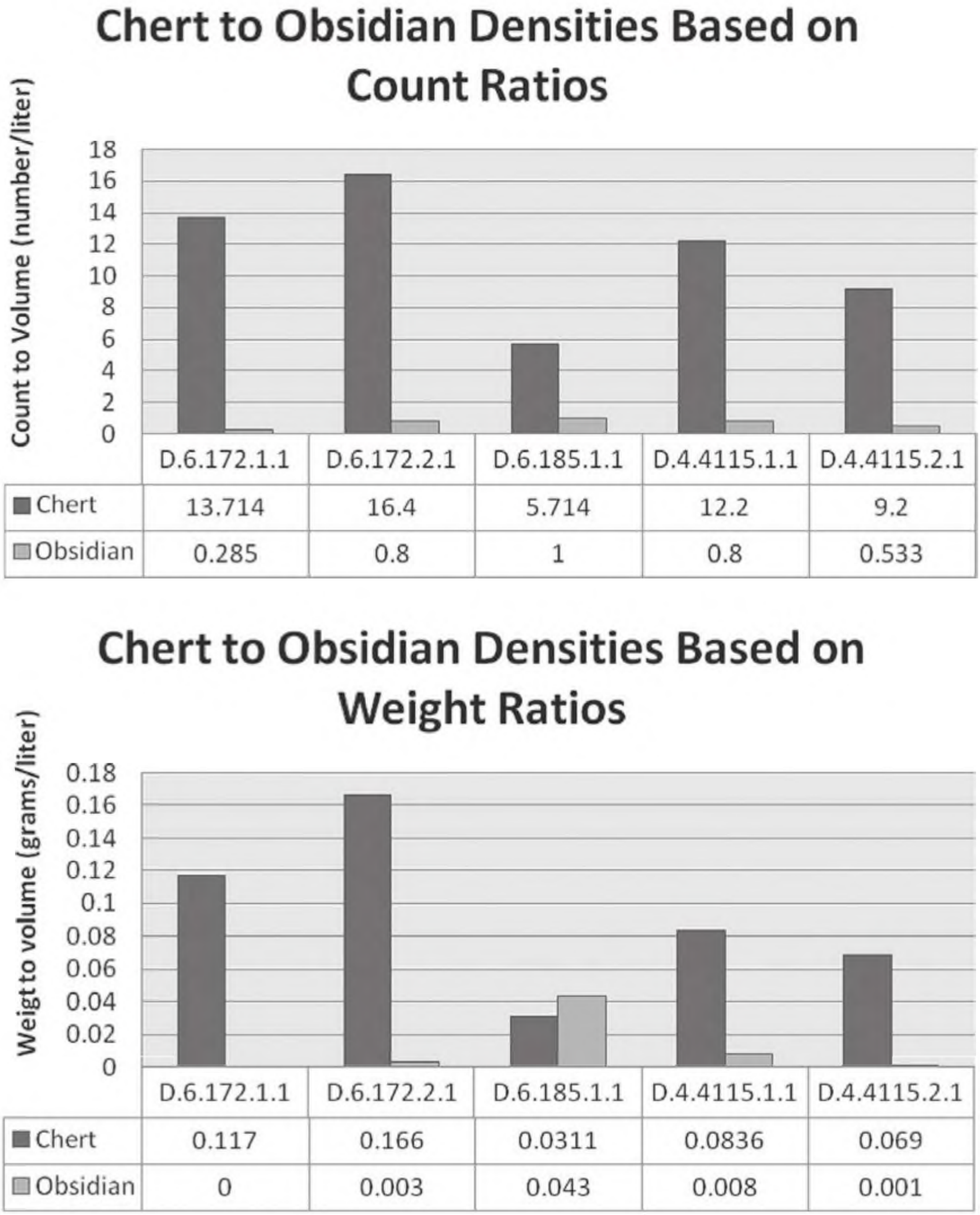


	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Ceramics	31.142	2.2	30	3	19.067
■ Lithics	14	17.2	6.714	16.4	9.733
■ Bone	60	102.8	135.857	28.8	46.8



	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Ceramics	0.805	0.095	1.616	0.116	0.306
■ Lithics	0.117	0.1712	0.074	0.101	0.07
■ Bone	0.312	0.42	1.519	0.38	0.615

Fig. 6. Material densities based on count and weight ratios per liter for samples from Rooms #1 and #2 in Kenan Tepe's Ubaid Period Burnt House.



Chert to Obsidian Densities Based on Count Ratios

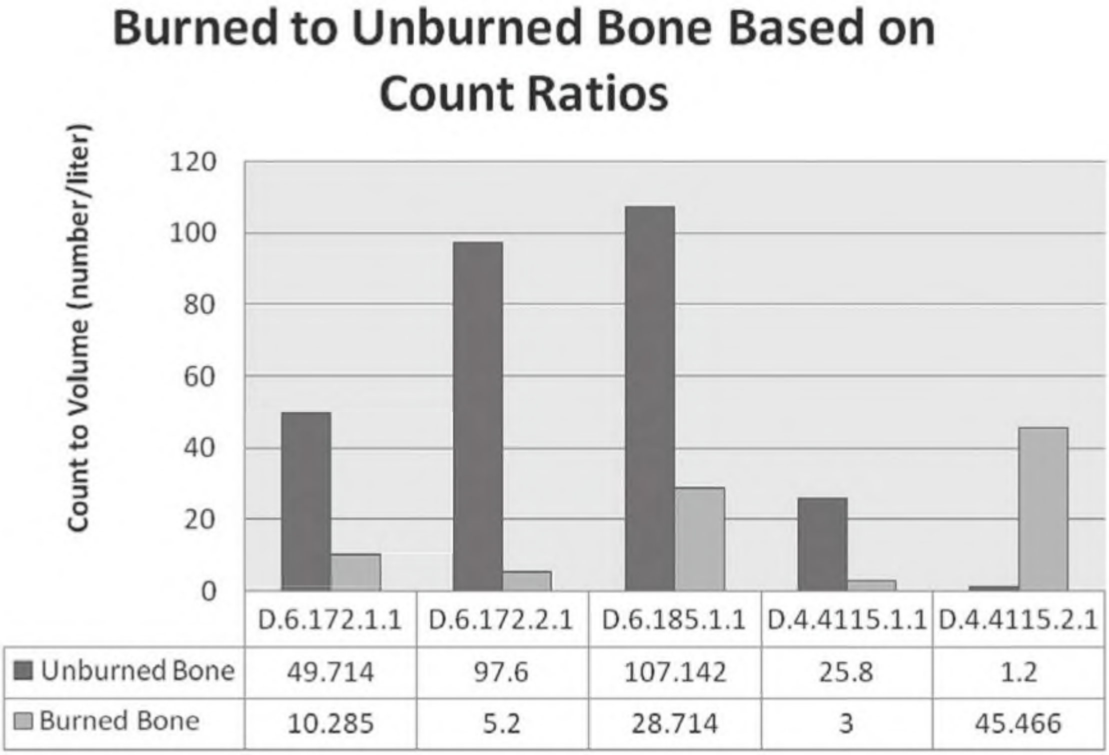
	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Chert	13.714	16.4	5.714	12.2	9.2
□ Obsidian	0.285	0.8	1	0.8	0.533

Chert to Obsidian Densities Based on Weight Ratios

	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Chert	0.117	0.166	0.0311	0.0836	0.069
□ Obsidian	0	0.003	0.043	0.008	0.001

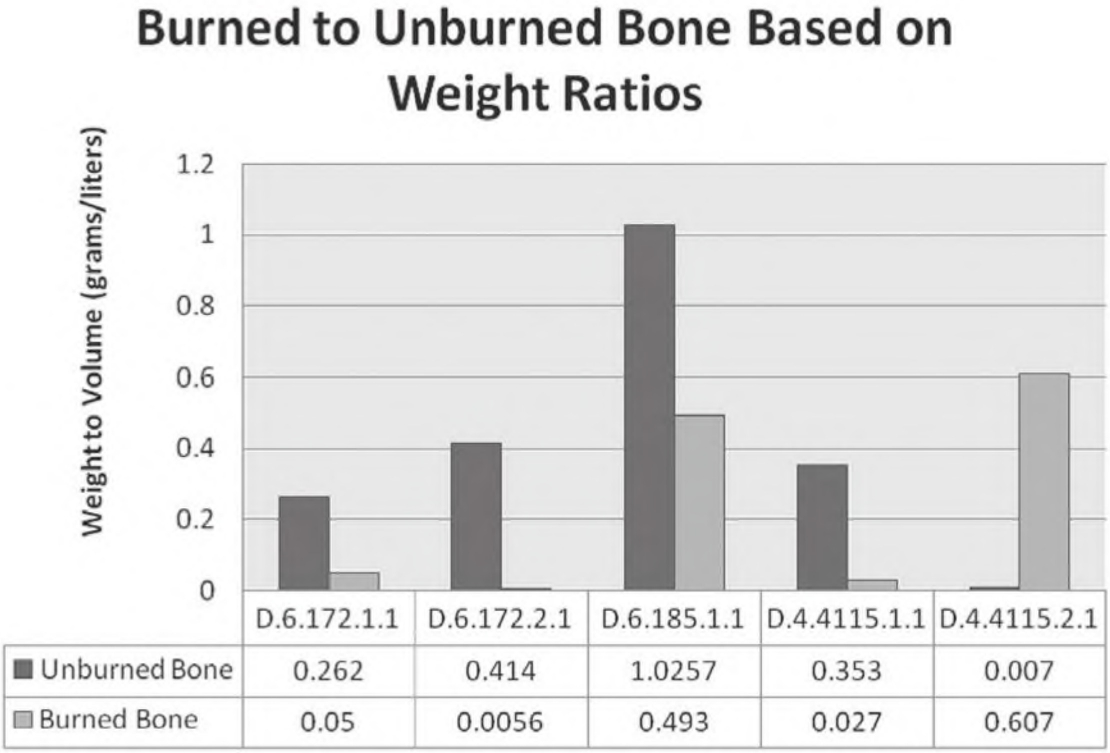
Fig. 7. Chert to obsidian densities based on count and weight ratios per liter for samples from Rooms #1 and #2 in Kenan Tepe's Ubaid period burnt house.

Bone is by far the most ubiquitous microartifact category within Rooms 1 and 2. Fig. 8 displays the ratio of burned to unburned bone within the samples. If the burning recorded on bone microdebris was the result of postdepositional processes, such as the fire that destroyed the Burnt House, we would expect the ratio of burned



Burned to Unburned Bone Based on Count Ratios

	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Unburned Bone	49.714	97.6	107.142	25.8	1.2
▨ Burned Bone	10.285	5.2	28.714	3	45.466

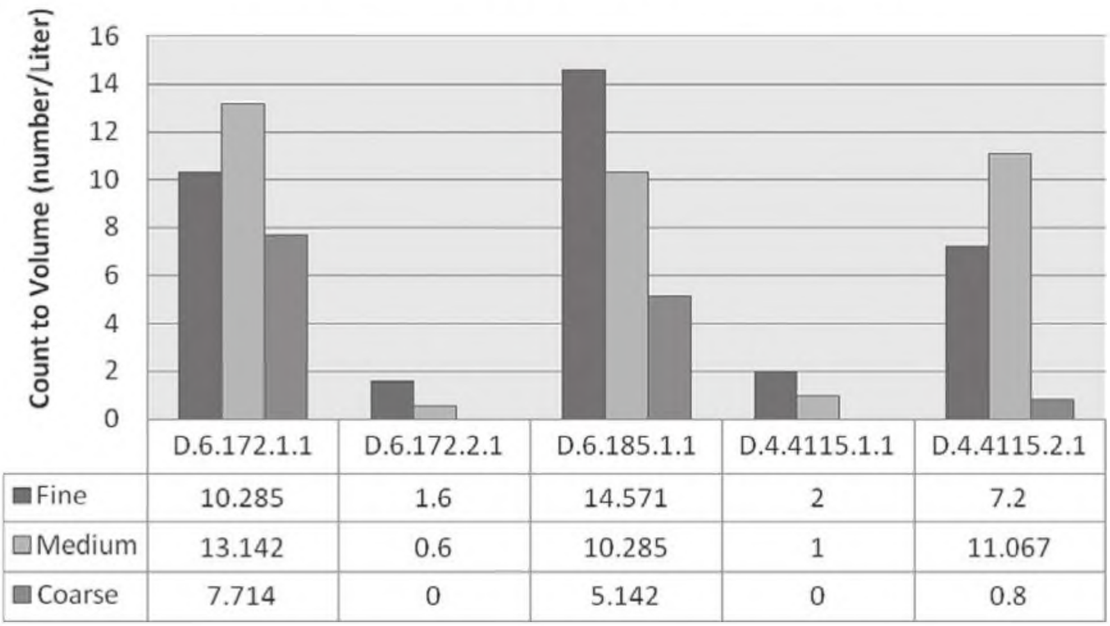


Burned to Unburned Bone Based on Weight Ratios

	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Unburned Bone	0.262	0.414	1.0257	0.353	0.007
▨ Burned Bone	0.05	0.0056	0.493	0.027	0.607

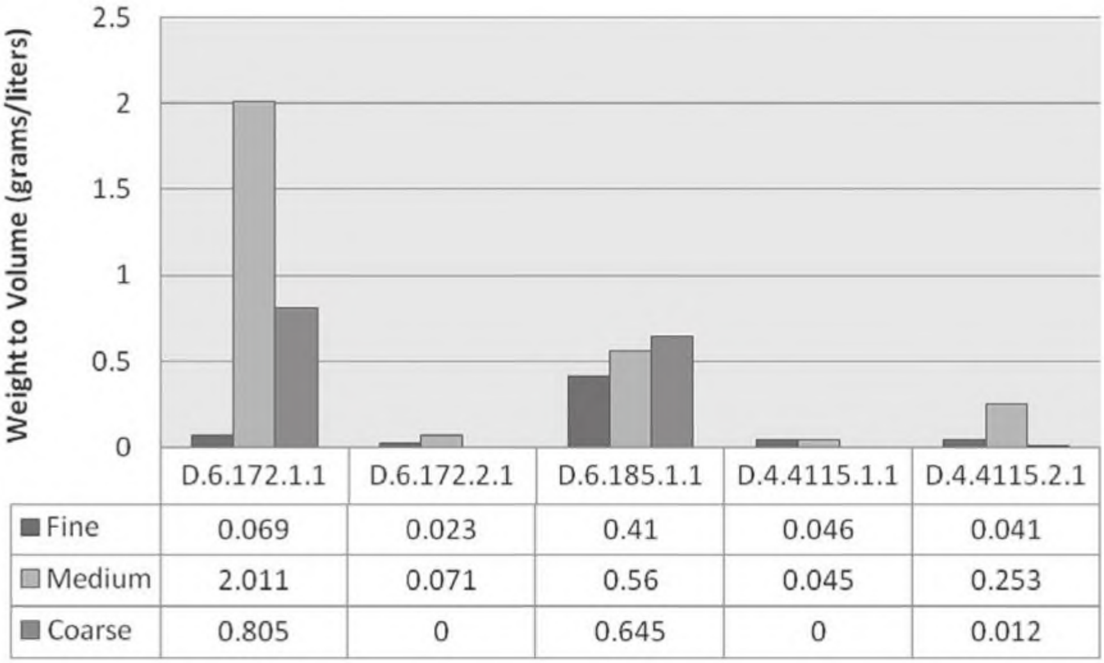
Fig. 8. Burned to unburned bone densities based on count and weight ratios per liter for samples from Rooms #1 and #2 in Kenan Tepe's Ubaid Period Burnt House.

Fabric Type Ratios Based on Count Densities



	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Fine	10.285	1.6	14.571	2	7.2
■ Medium	13.142	0.6	10.285	1	11.067
■ Coarse	7.714	0	5.142	0	0.8

Fabric Type Ratios Based on Weight Densities



	D.6.172.1.1	D.6.172.2.1	D.6.185.1.1	D.4.4115.1.1	D.4.4115.2.1
■ Fine	0.069	0.023	0.41	0.046	0.041
■ Medium	2.011	0.071	0.56	0.045	0.253
■ Coarse	0.805	0	0.645	0	0.012

Fig. 9. Ceramic fabric-type densities based on count and weight ratios per liter for samples from Rooms #1 and #2 in Kenan Tepe's Ubaid Period Burnt House.

to unburned bone to be significantly higher than the ratio displayed in fig. 8. The HAP samples from which these data come are composed of the floor matrixes, and thus the artifacts therein were not likely exposed to the fire that destroyed the house. Instead, these remains may represent the residue of animal meat that was cooked over an open fire. In this scenario, we would expect only the bone that was directly exposed to the fire to exhibit carbonization. With this in mind, I suggest that bone microdebris, especially bone microdebris that includes a small percentage of burned bone (between 5% and 15%, for example), may be indicative of the consumption of roasted meat. If this hypothesis is correct, then the high ratio of bone debris containing significant but not overwhelming amounts of burned bone suggests that meat consumption was an activity commonly carried out within the large central room of Kenan Tepe's Burnt House.

Fig. 9 divides the microceramics into fine, medium, and coarse fabric types. These graphs show that coarse wares are almost completely absent from the samples, and that fine and medium fabrics are relatively common. These data parallel conclusions drawn from the macroceramic data. They suggest that fine-fabric ceramics, which are most commonly small decorated serving vessels (discussed previously), were utilized frequently, perhaps for eating, in Rooms 1 and 2. They also suggest that medium fabrics, which are most commonly undecorated medium jars, were also utilized in these spaces. The data also support the conclusion that coarse-fabric cooking pots were not commonly used in these spaces.

To address the question of where lithic production took place, laboratory analysis focused on microsamples from other spaces in and around the Burnt House. Lithic count densities are higher on inside surfaces, and lithic weight densities are higher on outside surfaces. This suggests that lithic debris on exterior surfaces was generally larger than lithic debris from interior surfaces. Whether this is due to higher trampling rates on interior surfaces or differences in the types of lithic modification carried out on inside in contrast with outside surfaces is uncertain. It is also interesting to note a sharp spike in the lithic data from one particular sample. This sample emanates from the exterior surface on the north side of the Burnt House (outside surface #3; fig. 2). The same area also exhibits a spike in the macro-lithics, where 92 macro-chert and 25 macro-obsidian lithics were discovered. This is also the find-spot of the only obsidian core belonging to this phase of Ubaid occupation. In the aggregate, these data suggest that lithic modification or manufacture was localized in the outside work area north of the Burnt House.

Lithics

The most common raw material utilized by this household was chert that derives from local river gravels. Obsidian, on the other hand, must have been acquired from much further afield, since the nearest sources are more than 150 km to the north. Obsidian accounts for approximately 24% of the material in the Ubaid lithic assemblage. Three types of obsidian have been discovered: green, opaque, and brown. Our assumption is that the different types of obsidian recovered derive from different obsidian sources and thus also traveled different supply lines. An analysis of the lithic corpus from the Burnt House shows that green obsidian dominates this assemblage. This may indicate that, although members of this household had access to obsidian

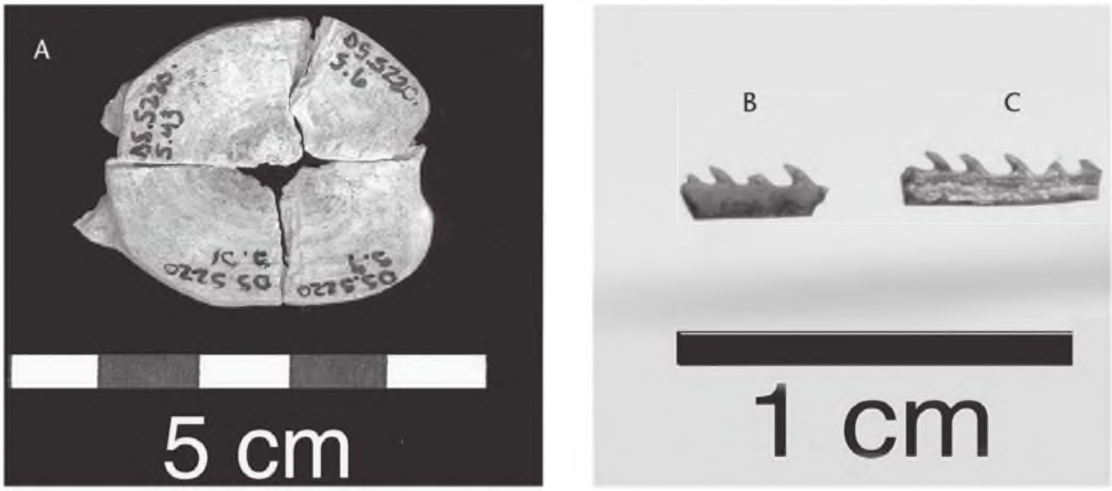


Fig. 10. Fish bones from Kenan Tepe. On the left (A) is a vertebra of a very large fish. On the right (B and C) are jaw bones from very small fish.

from a number of sources, most of their raw material probably derived from a single source and perhaps even a single set of suppliers.

The corpus of chert tools from the Burnt House includes flakes, retouched flakes and blades, piercers, scrapers, and a single arrowhead. Chert flakes are by far the most common. A small portion of the assemblage is retouched and about 25% of the retouched chert artifacts exhibit gloss. Reconstructable nodules from later contexts suggest that little preparation or shaping was carried out before raw materials were knapped into lithic tools. Instead, chert cobbles were smashed open to provide a suitable surface from which to begin flaking. These data suggest that chert tools were manufactured locally, perhaps as part of daily household activities, by relatively unskilled knappers. They also suggest that chert flakes and blades were commonly used for harvesting or processing vegetable matter.

Kenan Tepe's obsidian industry consists mostly of flakes and blades. The blade-based technology is composed of blade segments and retouched pieces. Generally speaking, obsidian tools exhibit greater craftsmanship than chert tools. Among the skillfully manufactured obsidian tools are several forms of arrowheads (Parker et al. 2006: fig. 25, for example), two vessel fragments, a bead, button or pendant, and a small obsidian disc. A number of artifacts resembling a form often described as "Çayönü tools" are also present in the Kenan Tepe corpus (Parker et al. 2009). These data suggest that the majority of the obsidian blades at Kenan Tepe were not produced within the household but were instead acquired through local or regional networks (Parker et al. 2009: 123–29). Obsidian flake reduction, on the other hand, appears to have taken place locally. This is evidenced by a number of early-stage flakes, sometimes with outer surfaces.

The Faunal and Botanical Remains

The faunal data analyzed thus far suggest that Kenan Tepe's Ubaid Period inhabitants relied primarily on domesticated sheep and goat, with a lesser emphasis on

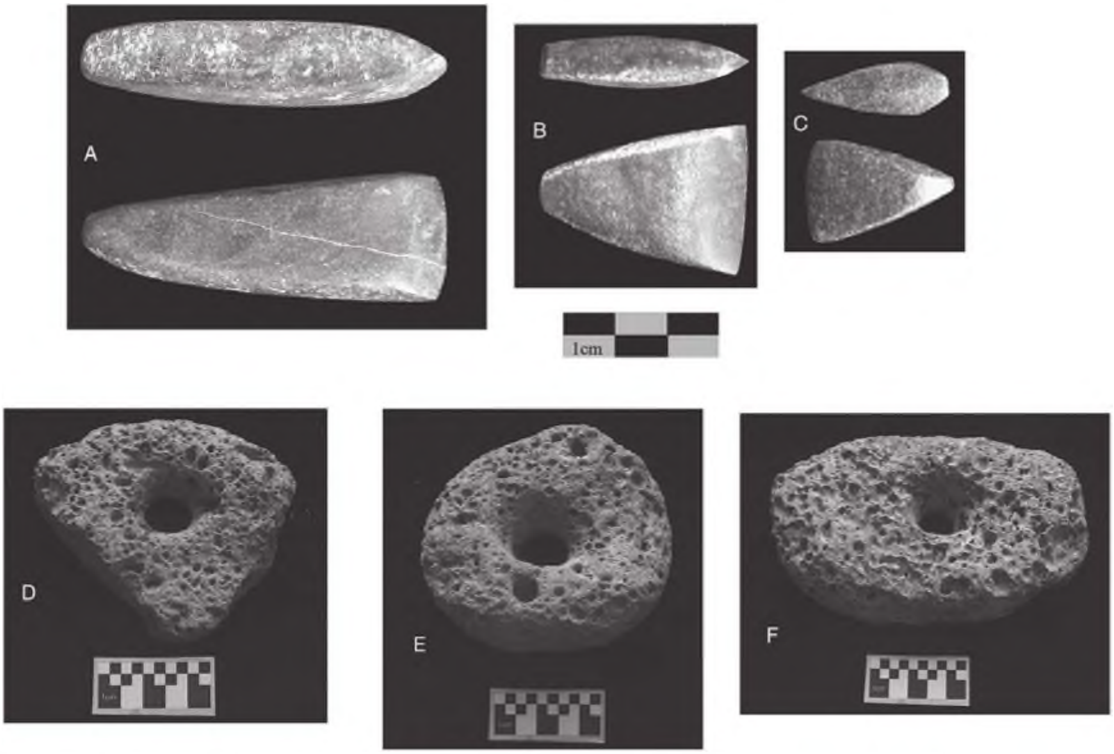


Fig. 11. A, B, and C are stone axe-heads. D, E, and F are stone fishnet weights.

domesticated cattle and pigs. However, wild taxa such as red deer, turtle, and fish also played an important role in the Ubaid subsistence system (Parker et al. 2008).[7] The exploitation of riverine resources is an interesting aspect of Ubaid subsistence patterns that is emerging from the Kenan Tepe data. Recent work on the geomorphology of the Upper Tigris River region suggests that the Tigris flow was likely considerably higher in prehistory than it is today (Parker et al. 2009: 86–88). In this context, the remarkable size of a number of fish vertebrae discovered in Ubaid contexts at Kenan Tepe is notable (fig. 10A). It should also be noted that bones and scales belonging to very small fish are common in the microsamples (fig. 10B, C). No fishing hooks have yet been identified at Kenan Tepe. However, a number of artifacts we believe to be fishnet weights have been discovered (fig. 11D, E, F). Another category of evidence for riverine resource exploitation is shell.[8] During the summer of 2005, UTARP team members excavated a shell midden that was apparently located just outside of the Ubaid settlement. This midden contained more than a thousand shells belonging to a riverine mollusk. Fragments of similar shells have been frequently recorded (in far smaller quantities of course) in numerous Ubaid contexts at the site. Furthermore, bivalve shell is frequently encountered in the microsamples from a variety of contexts in and around the Burnt House. These combined data suggest that riverine resource exploitation was a very important component of Kenan Tepe's Ubaid Period subsistence system.

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[7] The faunal data from Ubiad Period contexts are currently being analyzed by Jenni Henecke at SUNY Stonybrook. I would like to thank Jenni for supplying the data summarized in this section. Since this research is still underway, the percentages of species present is still in flux. At the time of writing, approximately 300 animal bones from contexts contemporary to Kenan Tepe's Burnt House (Ubaid Level 3) had been analyzed (another 631 animal bones from an earlier phase [Ubaid Phase 1] are discussed in Parker et al. 2008). Of these, approximately 80% belong to sheep/goat, 13% to cow, and 5% to pig. The remaining 3% we believe belong to wild species.

[8] For a discussion of the importance of shellfish in prehistoric societies, see Derin 2007.

The botanical remains from Kenan Tepe are already the subject of an essay in this volume (Graham and Smith, this volume; see also Parker et al. 2009). For this reason, I will only make a few general remarks here about the plant exploitation. First, the botanical data confirm that the cultivation of grain, particularly barley and wheat, was a central focus of plant exploitation at Kenan Tepe during the Ubaid Period. Of particular interest, however, is the definitive evidence for lentils and peas. In addition to the wonderfully preserved botanical remains from the Burnt House, UTARP team members recovered large quantities of grain pseudomorphs. These masses of decomposed grain and/or grain chaff are manifest in the archaeological record as (often quite thick) white layers. In several cases, masses of grain pseudomorphs were recovered from small storage chambers (discussed previously). The largest concentration of grain and chaff pseudomorphs were recovered north of Room 8 on outside surface #3 (fig. 2 and Parker and Dodd 2005: figs. 3, 4, and 5). An examination of the structure and morphology of these pseudomorphs suggests that they are the remains of barley or wheat grain and chaff.

Small Finds

A number of small finds were discovered *in situ* on floors or surfaces in and around the Burnt House. These finds include artifacts related to textile production and personal ornamentation (Table 2). A total of 19 spindle whorls were discovered inside the house, 12 of which were recovered from a 1.5-square-m area on the floor of Room 1. Other evidence that may be indicative of textile production includes three bone awls recovered from Room 1, and three more recovered on an outside surface north of the Burnt House (on outside surface #3; Parker and Dodd 2005: 84, fig. 18G, H). It should also be noted that the pseudomorphic remains of two textiles or mats were also recovered during excavation. The first was discovered on outside surface #3 (Parker and Dodd 2005: 72, figs. 3–5). The partially preserved remains of a second textile or mat were recovered in the center of Room 1. These combined data suggest that textile production was a primary activity that took place within the Burnt House.

Several artifacts excavated from the Burnt House can be categorized as personal ornaments, including a number of beads and pendants. The very small size of several bone beads discovered in the HAP samples taken from the floor of the Burnt House testifies to the skill of the craftsmen responsible for their production. Furthermore, the fact that the beads excavated were not found in large concentrations supports the hypothesis that they were not deposited as a result of the breakage and loss but may instead suggest that bead production was carried out in or near this location. The possibility that finely made ornaments were produced in or near the Burnt House is supported by the discovery of three small basalt axe-heads on the floor of Room 1 (fig. 11A–C). Several observations about these axe-heads suggest that they were tools used for specialized production. First, they are very small. The largest is only about

7.5 × 2.5 cm. The second is approximately 4 × 3 cm and the smallest is approximately 2.5 × 2 cm. (fig. 11A–C, respectively). Since these tools were found together, we can only assume that they belonged to the same tool kit. This being the case, it should also be noted that the difference in size between each of these axe-heads is very minimal. These tools could only have belonged to a craftsman whose skills were finely developed enough to appreciate the subtle differences between these tools.

Cooking

A number of categories of the previously outlined data can be leveraged to provide the basis for a discussion of cooking and culinary practices during the Ubaid Period. Among the ceramic corpus from Kenan Tepe, there are a significant number of sherds that are the remains of cooking vessels. Cook-pots can be identified by their coarse grit temper, large mineral inclusions, lightly burnished exterior surfaces, and especially by soot or carbonization that is usually concentrated on the bottom and lower exterior surfaces of vessels (Roaf 1989: 112).[9] The sooting recorded on sherds from the Kenan Tepe corpus appears to have been created by regular contact with fire, which often alters the fabric on the exterior bottom surfaces of vessels (Hopwood and Mitra, this volume; Orton et al. 1993: 222; Rice 1987: 235). By looking for patterns in the correlation between vessel shape, fabric, and sooting, ongoing analysis has isolated two forms that appear to be indicative of Ubaid cook-pots from Kenan Tepe (Parker and Kennedy 2010). The first is the short angle-rim jar (fig. 12A–C). This is a round, medium-sized, hole-mouthed jar with an average rim diameter of 18.95 cm (std = +/–5.66 cm). This type of cook-pot was likely supported by andirons or balanced by stones over/in charcoal or dung fires. The size and shape of these vessels suggests that they were primarily used for heating or slow-cooking well-saturated foods such as soups, stews, or porridge (Bottéro 2004: 52–53). The second shape identified as part of the Ubaid cooking assemblage is the rounded straight-rim bowl (fig. 12 D–G). These relatively shallow bowls were also likely supported by andirons or stones over charcoal or dung fires, but in this case these bowls were probably used for frying or baking foods that were not heavily saturated.

Two interesting categories of food debris have been identified in the microarchaeological samples. First, the remains of various kinds of fish are relatively common. Several jaws of very small fish (probably less than 20 cm in length; fig. 10) and a number of scales from slightly larger fish (probably larger than 30 cm in length; Casteel 1974) have been identified in microarchaeological samples from surfaces outside the Burnt House. My assumption is that small- and medium-sized fish, which were likely caught using nets held down by stone weights (fig. 11 D–F), were processed on outside surfaces. Small fish were probably fried or included in stews after the heads were removed. Larger fish were scaled and probably cleaned before they were fried or stewed. As mentioned above, a large amount of shell from a fresh-water mollusk was recovered in an Ubaid Period midden. Tiny shell fragments were also recovered in all the microarchaeological samples included in this study. An examination of approximately 150 complete shells from the Ubaid midden showed

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[9] Of the total corpus of Ubaid Period ceramics analyzed from Kenan Tepe, 1,032 or 31.37% of coarse-fabric sherds show evidence of sooting or carbonization (Parker et al. 2009: 113).

Fig. 12 (opposite). Cooking pots from Kenan Tepe. A, B, and C are short angle-rim jars. D, E, F, and G are rounded straight-rim bowls.

A: D5 L5079 KT5554 #1: Brown exterior surface (10YR 5/3). Very dark grayish-brown fabric (10YR 3/2) abruptly transitioning to a brown core (10YR 5/3). Dark grayish-brown interior surface (2.5Y 4/2). Heavily blackened on the interior and exterior body. Large grit temper.

B: D5 L5094 KT11 #1: Weak red exterior surface (2.5 YR 4/2). Brown fabric (7.5 YR 4/2) grading to very dark grayish-brown core (10 YR 3/2). Light reddish-brown interior (2.5 YR 6/3). Blackened on lower exterior surface. Coarse sandy grit temper.

C: E2 L16 KT15 #1: Light brown exterior surface (7.5YR 6/4). Light brown core (7.5YR 6/4). Light brown interior surface (7.5YR 6/4). Knob on rim. Fine grit and fine chaff temper.

D: D5 L5146 KT6 #2: Light reddish-brown exterior surface (2.5YR 7/4). Light brown fabric (7.5YR 6/3) grading to a red core (2.5YR 5/6). Light red interior surface (2.5YR 6/6). Some evidence of sooting on exterior surface.Medium chaff temper.

E: Area E Trench 2 Locus 25 KT 7 #6: Pink exterior surface (7.5YR 7/3). Reddish-yellow fabric (7.5YR 6/8) abruptly changing to a very dark gray core (7.5YR 3/1). Pink interior surface. Wash on interior and exterior surfaces. Fine grit and fine chaff.

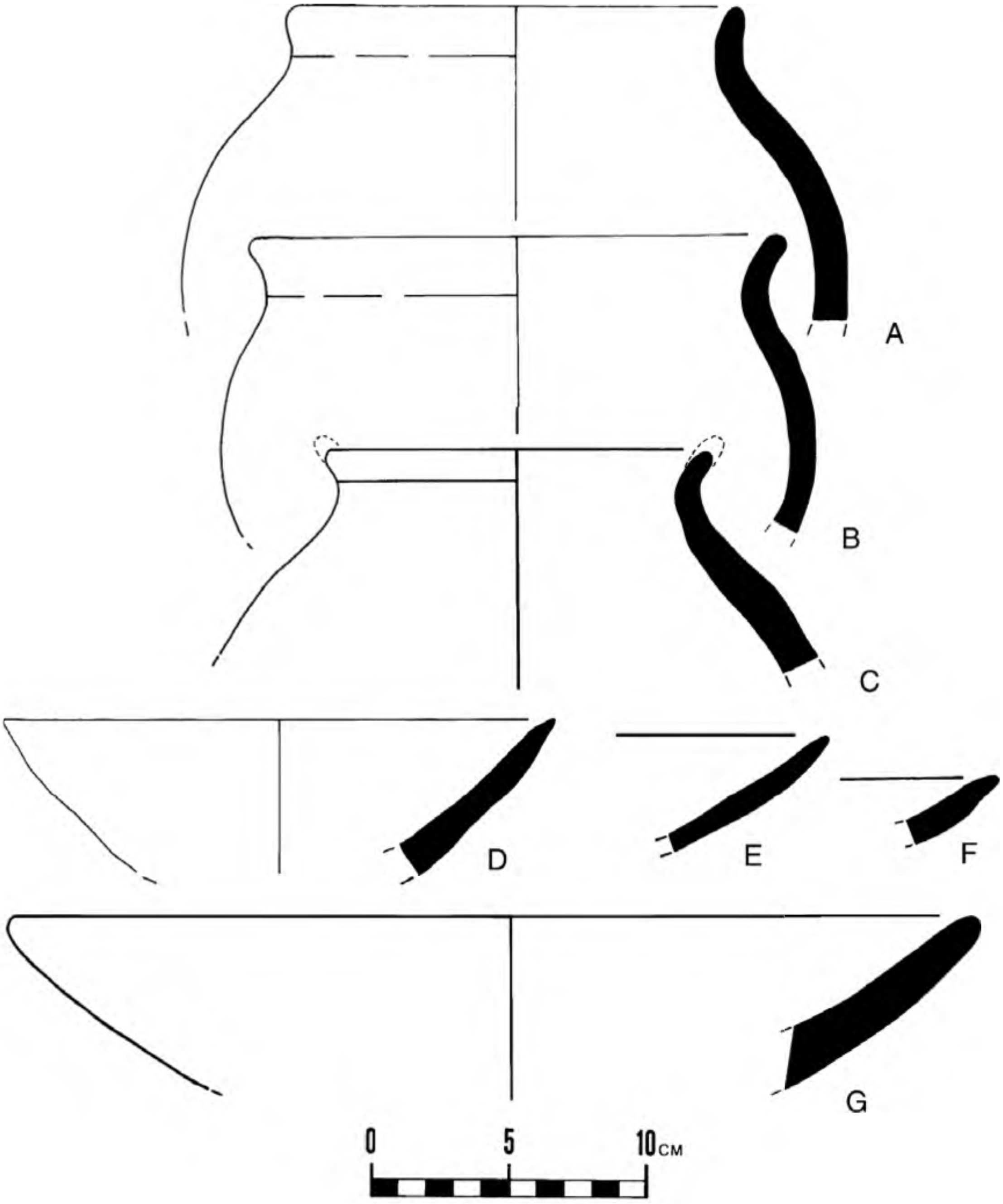
F: Area E Trench 2 Locus 18 KT 12 #1: Very pale brown exterior surface (10YR 8/4). Yellowish red fabric (5YR 5/8) abruptly changing to a very dark gray core (3/N). Very pale brown interior surface (10YR 8/4). Wash on interior and exterior surfaces. Calcareous grit and very fine with some 1g chunks.

G: D5 L5160 KT 3 #6: Light brown exterior surface (7.5YR 6/4). Strong brown fabric (7.5YR 5/6) grading to a dark grayish-brown core (10YR 4/2). Brown interior surface (7.5YR 5/3). Fine and medium grit and fine chaff temper. Blackened on lower exterior surface.

that none of the samples exhibited evidence of sooting and no regular chipping that might be indicative of shucking was recorded. These data suggest that mollusks were steamed or poached before consumption.

Ubaid cuisine at Kenan Tepe also included a wide variety of plants and animals, including wheat, barley, peas, and lentils as well as sheep, goat, cattle, and pig. A number of wild species were likely also eaten. This household's focus on grain processing and storage and the discovery of numerous grinding stones suggests that bread was also an important part of Ubaid cuisine. No Ubaid Period bread ovens have yet been unearthed at Kenan Tepe (Parker 2011). This being the case, it is certainly possible that rounded straight-rim bowls could have acted as bread molds (Bottéro 2004: 49). Lentils were likely included in stews or made into soup. Peas could have been eaten raw, included in stews, or added to fried meat or fish dishes. A wide variety of meats were eaten in and around the Burnt House. Although meats were likely common in Ubaid stews, the discovery of burned bone microdebris suggests that meats were also roasted.

These data provide evidence to support the following characterization of some aspects of Ubaid culinary practices. They suggest that stews, probably cooked slowly over low intensity fires, were a common part of Ubaid cuisine. Stews may have in-



cluded any combination of fish, meat, lentils, and peas.[10] Grains may also have been added to create a porridge or gruel. Fried foods in various combinations as well as roasted meats were probably also common. Ubaid diet was supplemented by exotic meats and mollusks. The data presented here support the hypothesis set forth by Hopwood and Mitra (this volume) that the method of heating probably varied, depending upon the type of cooking: stews were likely cooked over less-intense, slow-burning dung fires, and fried and roasted foods were likely prepared over hotter wood or charcoal fires.

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[10] Note that, in her discussion of Aztec cooking, Brumfiel (1991) has suggested that low-temperature simmering requires only occasional monitoring and thus allowed Aztec women to carry out a number of other activities during the process of meal preparation.

The Event

In an effort to illuminate subsistence and production patterns of an Ubaid Period household, I have briefly explored the various categories of data emanating from Kenan Tepe's Burnt House. To further illustrate modes of production undertaken by this prehistoric household, I will turn now to "the event" that made the preservation of this dataset possible. One of the great advantages of archaeology is that archaeological data most often lend themselves to the study of the *longue durée* and, thus, most practitioners in the field are interested in diachronic studies. The flip side of this is that archaeologists are rarely able to research specific events. In this subsection, I will investigate the event that destroyed the domestic structure within which members of the household under study lived and worked. I will use this discussion to highlight aspects of production and consumption within this household as they were preserved at a specific moment in time.

Graham and Smith's study of the botanical remains from the Burnt House (this volume) suggests that Room 3 was a multiuse space that, at the time of the destruction of the Burnt House, was apparently being used to store dung. When excavated, this room was completely filled with ash. The condition of the floor and walls in Room 3, which were baked far more thoroughly than in other parts of the house, led to the hypothesis that the fire that destroyed the house may have started, or at least was concentrated, there. In fact, the intensity of the fire appears to have dissipated with distance away from Room 3. The wall between Rooms 1 and 3 was best preserved due to the fact that it was thoroughly baked by the fire and was thus preserved to a height of more than 80 centimeters (fig. 3B). This is in stark contrast to the walls between Room 1 and Rooms 4 and 5. In these cases, it appears that the walls were not baked by the fire but were instead partially buried by burning debris that fell from the roof. These observations suggest that the fire likely spread from the contents of Room 3 to the wooden beams supporting the roof above that room and the neighboring Room 1. Remains in this collapse layer suggest that numerous activities were taking place on the roof at the time of the destruction. These activities focused primarily on the processing of grain. The remains of several baskets and a number of unfired clay basins or tubs were recovered from the collapse layer. Graham and Smith have also noted that a number of the botanical samples from the collapse layer are remarkably "clean," suggesting that these samples represent the final stages of grain processing (this volume).

Further evidence for grain processing comes from the outside work area north of the house. Here we discovered ample evidence of the early stages of grain processing (Parker and Dodd 2005: 71–72). This surface was covered by thousands of compacted plant pseudomorphs. Examination of the structure and morphology of these pseudomorphs suggests that they are remains of barley or wheat chaff. In part of the trench, this organic mass covered the pseudomorphic remains of a very finely made grass mat. The data suggest that grain chaff once formed a pile against the wall of the structure and that a grass mat was there to catch the winnowed grain. Ethnographic parallels can be drawn from villages throughout modern Turkey, where chaff is often stored, usually for fodder, against the side or back wall of houses. The same surface also yielded numerous examples of painted fine and unpainted coarse Ubaid pottery, obsidian, and chert lithics, a bone bead, a stone pendant in the shape of a fish, two bone awls, several possible spindle whorls, three fish-net weights, and a fragment of a ground obsidian bowl.

These data suggest that the Burnt House was destroyed in the early summer just after the harvest. Members of the household were engaged in the winnowing of grain in the yard north of the house (outside surface #3). We can speculate that the grain chaff was stored for later use and the winnowed grain was stored in the small cell rooms adjacent to the house. Some of the grain was taken to the roof of the house for further processing (cleaning, grinding, and drying, for example). My assumption is that this grain was being processed for immediate or relatively immediate use. At the same time that members of the household were busy processing the harvest, other members of the household were engaged in textile and perhaps jewelry production inside the house. The data suggest that tools used for the specialized production of ornaments and/or other goods likely made of bone, stone, or wood were produced, used, or stored in this room. Cooking appears to have taken place in the yard south of the Burnt House (outside surface #1), and consumption of cooked items appears to have been concentrated in Room 1.

The house was abandoned after the fire. Though later work surfaces and some architectural remains were discovered in overlying strata, we have no evidence that the inhabitants attempted to dig through the rubble of the house. It also appears that the cell rooms filled with grain did not burn (perhaps because they were tightly sealed with reed and mud), and only one or two of them might have been emptied.

Conclusion

I began this essay by saying that my goal was to explore how the substantial advances in subsistence production achieved during the Neolithic were applied during the subsequent Ubaid Period. By changing the focus of analysis from the regional to the local, I also aimed to investigate patterns of subsistence and production at the household level in an effort to explore the interface between the local and the regional in the formation of patterns of material culture. Having briefly enumerated the data emerging from research by UTARP members at the site of Kenan Tepe in southeastern Anatolia, I would now like to step back from the data to draw more generalized interpretations that address these goals.

Scholars of the ancient world generally agree that the advent, adoption, and spread of agriculture was a slow process. Evidence from numerous early agricultural villages across the Near East suggests that subsistence production based on domesticated plants and animals did not play a dominant role in subsistence systems until relatively late in the Neolithic Period (Matthews 2000: 116–17, 2003: 82–84; Moore et al. 2000: 508; Rosenberg 1999: 31). The data from Kenan Tepe demonstrate that this trend continued into the Ubaid Period, when households like the one studied here, were largely but still not completely dependent on domesticates for subsistence. Kenan Tepe occupies a position overlooking the Tigris River at the foothills of the Taurus Mountains, and prehistoric inhabitants thus had access to a wide array of subsistence options. The data from Kenan Tepe show that although there was considerable focus on cereal cultivation and animal husbandry, members of the household also engaged in a broad spectrum of subsistence options, including hunting wild animals, fishing, gathering aquatic resources, and exploiting numerous wild and domestic plants.

Henrickson and Thuesen (1989: 11–15) characterize the Ubaid Period as a time of increased social complexity. What evidence is there for social complexity among the inhabitants of Kenan Tepe's Burnt House? To begin such a discussion, we must first define what we mean by social complexity. Rothman (1994) and Stein (1994) define social complexity in terms of the level of social integration and centralization. Quoting Blanton et al. (1993: 17), Rothman reasons that economic integration is "the extent to which households or other units are interdependent in terms of the exchange of goods and services" while political integration is the "the extent to which units are autonomous in power and decision making." Rothman (1994: 4) thus defines complexity as "the degree of functional differentiation among societal units." Flannery (1972: 409) defines centralization as "the degree of linkage between the various subsystems and the highest order controls in society." With these definitions in mind, let us consider the level of integration and centralization among the Ubaid inhabitants at Kenan Tepe.

The data suggest that the household analyzed here was internally integrated. However, most aspects of subsistence appear not to have been integrated into a larger social system. Cultivation, gathering, and cooking were all undertaken at the household level. In terms of subsistence, then, this household was likely an autonomous economic unit. Other aspects of the household economy may have been more integrated. First, it is possible, but by no means certain, that textile production may have been intended not just for household consumption but also to accumulate tradable surplus. Ceramics are by far the most ubiquitous artifact category from the Burnt House. However, no definite evidence of ceramic production has yet been unearthed in or near this structure. Though it is quite possible that some or all of the roughly made ceramics (such as Coba Bowls, unfired clay basins, and maybe even cook-pots) were produced by members of the household, the locus of the production of more finely made ceramics, especially the decorated fine wares, is much less certain. Uniformity in form and fabric among the fine- and medium-ware ceramics as well as the fact that many of the painted motifs on Ubaid ceramics from Kenan Tepe find parallels across a very wide region suggests that ceramic production may have been carried out by local or regional specialists (Berman 1994). Chert can be procured locally, and there is evidence that chert lithic production was likely carried out at the household level (Parker et al. 2009: 123–28). However, this is not the case for obsidian. Since there are no local obsidian sources, raw materials traveled through regional networks before reaching households like the one occupying the Burnt House (Parker 2010). Furthermore, the obsidian lithic data suggest that many obsidian artifacts may have actually reached this household in finished form.

The data from Kenan Tepe thus suggest that the household discussed here was relatively autonomous in terms of subsistence but show emergent complexity in other aspects of the domestic economy. Although Henrickson and Thuesen (1989: 11–12) did not define exactly what they meant when they characterized the Ubaid

Period as the "developmental bridge" between the advent of agriculture and the formation of the state in Near Eastern history, the evidence presented here supports a characterization of this household as representing an intermediate step between the autonomous or semiautonomous groups of the Neolithic and the much more centralized societies of the Late Chalcolithic.

In spite of the hypothesis that this household appears to have been only loosely integrated into larger social networks, there is ample evidence that its members were active participants in the consumption and reproduction of supraregional cultural norms manifest in the archaeological record as patterns of material culture. The tripartite plan of the Burnt House itself mirrors widespread architectural uniformity (Roaf 1984). Members of the household that inhabited this structure were likely consumers of ceramics whose manufacture, shape, and surface treatment reflect cultural norms that were shared over a vast area. Whether or not members of this household influenced the styles of ceramics produced through patterns of consumption and use is not clear. However, if ceramics were manufactured locally, we can certainly hypothesize that issues of shared identity and/or ideology likely played an important role in the potter's choice to produce ceramics according to well-established regional traditions. One can only wonder if the textiles, personal ornaments, and cuisine produced as part of the Ubaid domestic economy reflected similar choices. These and other questions about the role that households played in cultural continuity and change can only be answered through continued research at the household level.

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Section 4

Urban Households

The Challenge of Identifying Households at Tell Kurdu (Turkey)

Rana Özbal

Introduction

Generalized categories such as the "Chalcolithic Period" or "Halaf Culture" that continue to function as points of departure for Near Eastern archaeology are slowly being complemented by bottom-up perspectives that employ theoretical advancements inspired by subdisciplines such as household archaeology. Instead of viewing these phases as brief transitional episodes within broad historical narratives or as antecedent periods for later cultural developments, household archaeology approaches challenge fixed metanarratives about social and cultural change and search for evidence of daily activities at the level of people, households, and communities. Because Early Chalcolithic societies often lack temples, palaces, and other public structures and domestic architecture comprises the majority of what has been unearthed, one would expect household-level investigations to have become established in Near Eastern prehistory long ago. This essay asserts that the study of households has largely been overlooked in Near Eastern archaeology because of the difficulty of identifying household compounds. Reducing the unit of analysis from large collectivities and whole cultures to the level of residential wards generates fundamentally new challenges. Many prehistoric sites in the Near East lack wide horizontal exposures necessary for a comparative perspective and a thorough study of different household complexes. The challenge persists, nonetheless, even at sites where excavations have unearthed substantial amounts of residential architecture, because recognizing individual households in the archaeological record at agglutinatively arranged and organically developed Near Eastern and Anatolian sites is often not feasible (Gülçur 2003; Merpert and Munchaev 1993b: 170; Özbal et al. 2004; Verhoeven 1999: 188).

This chapter uses the 6th-millennium B.C.E. levels at Tell Kurdu, located in the Hatay province of southern Turkey, to address the issue of identifying coherent residential groups in clustered dwelling complexes (Özbal et al. 2003, 2004; Özbal 2006). This logistical challenge is explored, evaluated, and assessed for the settlement as a whole. Although a permanent solution cannot be offered, this essay does demonstrate, based on observations of the architecture, access patterns, and insights into the use of space, how in some instances well-articulated and coherent households can indeed be identified. Thereafter, one such residential complex in the western part of the settlement is selected and some of the activities that must have taken place in the domestic sphere are reconstructed. In addition to traditional methods, such as architectural observations and the contextual study of artifacts, microscale analyses such as the chemical characterization of living floors and microartifactual analyses that collectively permit reconstruction of the daily routines of a Kurdu household are employed. An undercurrent running through the essay is the idea that observations gained in smaller arenas of households, people, and activity areas are always interlinked with overarching long-term social, cultural, economic, and political issues.

Household Archaeology: A Bottom-up Approach

Archaeology has traditionally been ruled by grand narratives. Accounts of the past were created by thinly spreading the sparse data available to chronicle phases that sometimes extended across millennia. Bottom-up perspectives, as advocated in this essay, have proved to be a successful way to break away from the predetermined standardized templates that textbooks often promote. A focus on daily activities and actions at the household level takes the scale down from large collectivities such as cultures and societies to localized narratives that foreground people as agents of change (Hendon 2004). Archaeologists generally agree, however, that identifiable individuals are rare, especially in prehistoric contexts. The focus, instead, is often successfully transferred to households and to various other residential, work, or craft groups. In some cases, prehistoric archaeology may even allow researchers to identify household members, like those concerned with domestic food procurement/production, household crafts, or maintenance. Likewise, one may also be able to identify social types such as "women," "children," or "nomads" (Ortner 1984: 149).

After nearly three decades of research, the study of small social collectives such as households and communities is no longer in its infancy (Flannery 1976; Wilk and Ashmore 1988; Wilk and Netting 1984; Wilk and Rathje 1982). Household archaeology has, in fact, established itself as a recognized subfield and takes a leading role in the burgeoning efforts to avoid large social collectivities and their depersonalized depictions of the past. The field has shed much of its functionalist, adaptive, and ecological foundations and has been transformed into a nuanced perspective that can identify differences in household organization, investigate the diversity in family structures, and recognize variation in the gendered division of labor and so forth (Allison 1999; Brumfiel 1992; Hendon 1996; Robin 2001).

A focus on the finer scale does not preclude insights into grander issues such as social and political change because details of daily life are intrinsically linked to broader themes. Describing and characterizing people and households as core societal units comprises only an initial step in the analysis; a main objective is to extrapolate from these small-scale units to broader questions and to clarify the way they articulate with grander social processes of change, political complexity, or economic organization at the societal level (Hendon 2004: 279).

The Challenge of Identifying Households

In the most general terms, households are referred to as a collection of people who live together, share the same resources, and partake collectively in domestic tasks and activities (Wilk and Netting 1984). This definition fits well with the household concept employed in this essay. The co-residentiality of households is an important concept archaeologically because it carries the assumption that houses function as the spatial referents or proxies for their residents (Blanton 1994; Hendon 2004; Kent 1990). Similarly, craft workshops or ritual compounds may be the tangible imprints of their respective social groups.

The problem we all face in our study of households is the gap between theory and practice. Although in theory households carry great potential as units of study, expand the research possibilities, and provide new angles by transforming the scale of the research agenda, in practice they are often difficult to detect, isolate, and analyze archaeologically. This is because the fluidity in household composition, membership, and spatiality adds challenges to identifying them; new alliances are continually formed through marriage ties and the residential structures may evolve as household groups grow and contract and are born anew (Çevik 1995; Guyer 1981; Hanson 2004). In other words, variability in household composition is also evident spatially: house structures are enlarged or abandoned to fit the changing needs of people as families grow and contract (Gerritsen 1999). Cyclical adjustments add depth and significance to households as units of analysis; nonetheless, the resulting unpredictability widens the gap between theory and practice.

It is not a coincidence that household archaeology was established first in Mesoamerica, where individual house-lots, each referring to a household unit, are often easily distinguished (Hendon 1996; Robin 2002, 2003; Sheets 1999; Webster and Gonlin 1988; Wilk and Ashmore 1999). Similarly, in the Andes, even though there are undoubtedly many nuances in definition, the fact that settlements are comprised of numerous independent walled circular compounds or patio-groups suggests that, spatially speaking, there is little room for confusion about what constitutes a household (Bawden 1982; D'Altroy and Hastorf 2001; Earle et al. 1987; Stanish 1989).

In the Near East, and especially in Anatolia, where agglutinative house plans are the norm and settlements have a tendency to grow organically where space permits and/or as family relations mandate, identifying household units may be more challenging.[1] Residential quarters in many ancient, medieval, and modern cities in the Near East are arranged according to the requirements of available space, presumably with the empty lots between houses being filled by an agglomeration of other buildings as the population grows (see, for example, Abu-Lughod 1983, 1987; Lampl 1968; but cf. Jayyusi 2008; Raymond 1994). This somewhat haphazard organization and the frequent lack of doorways—often the best indicators of access and connectivity—add to the difficulties of assessing just how the settlement was divided into sub-areas, quarters, or household compounds. Ultimately, these challenges may be among the reasons why archaeologists of the Near East have been reluctant to embrace the types of household archaeological perspectives that form the backbone of many New World approaches.

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[1] Some sites, especially in Anatolia, show clear evidence of easily identifiable independent units where each house is more or less identical; they are equipped with their own ovens, sleeping platforms, and storage facilities, resulting in an easy match between the household and the household space (e.g., French 1998; Karul 2009; Mellaart 1967; Roodenberg and Roodenberg 2008).

Some modern Near Eastern ethnoarchaeological accounts have in fact shown that there is often a lack of correspondence between the house as a spatial unit and the household as a conceptual unit (e.g., Horne 1994; but cf. Kamp 1993, 2000; Kramer 1979, 1982; Watson 1979). Horne's case-study in the Iranian village of Baghestan suggests that reasons for the mismatch between the house and the household may emanate from three main spatial and logistical issues: the quality of the construction or the permanence of the structure, the rate of building new structures, and, related to this, the amount of recycling of old structures (Horne 1994: 181). Other factors, such as the level of circumscription of the settlement (Steadman 2000), whether bounded by topographical factors or cultural limits such as boundary walls (Youkana 1997) may also add to crowding and the pressure to recycle empty lots. In situations where either new houses are rarely built or villages are bounded in some way, the inhabitants may be forced to reinhabit abandoned structures, adding to the degree of fragmentation across the village. In Baghestan for example, 78% of the households owned rented rooms (often for storage) in other parts of the settlement. In other ethnoarchaeological case-studies, one finds that rules of inheritance often dictate a reshuffling of the household and the recycling of older structures (Horne 1994: 170; Kramer 1982: 145; Watson 1979: 213). The challenges such situations would pose to archaeologists dealing with ancient households are obvious. Nevertheless, Horne is able to show that, regardless of the rate of dispersion and the number of associated rooms and domestic units spread across a settlement, houses and hence households can be defined by the location and unity created within their living rooms. She further develops this point:

> For the most secure attachment of households to houses it makes sense to focus on the living room and an immediate outside area as the "house," what in local Baghestani parlance would be called the "environs" of the household. By doing so, it is possible to free ourselves from culture bound notions about what constitutes a "house." (Horne 1994: 190)

This observation is significant because it emphasizes that households are defined by the activities they partake in rather than the space they occupy. In Baghestan, these activities took place in living rooms and in the immediate outside area. Even when the household holdings are dispersed, we can assume that most households have some core area that can be identified spatially. Moreover, in most Baghestani situations, when a compound is entered from a private threshold, rooms surrounding small- to medium-sized courtyards tend to belong to the same household (Horne 1994: 199–208). Larger agglutinate complexes may be shared by multiple households. These observations provide some tips to tackle the issue of identifying independent residential units in archaeological situations such as at Tell Kurdu.

The situation that Horne describes, where houses are recycled and households are dispersed, is surely not unique. The complexities of the village layout and household organization provided below for Tell Kurdu may in fact closely parallel what Horne describes for Baghestan. This chapter attempts to use bottom-up approaches and ultimately tries to gain insights into household organization and community dynamics through evidence for daily activities, routine tasks, structural clues concerning the architecture, and other data on household composition.

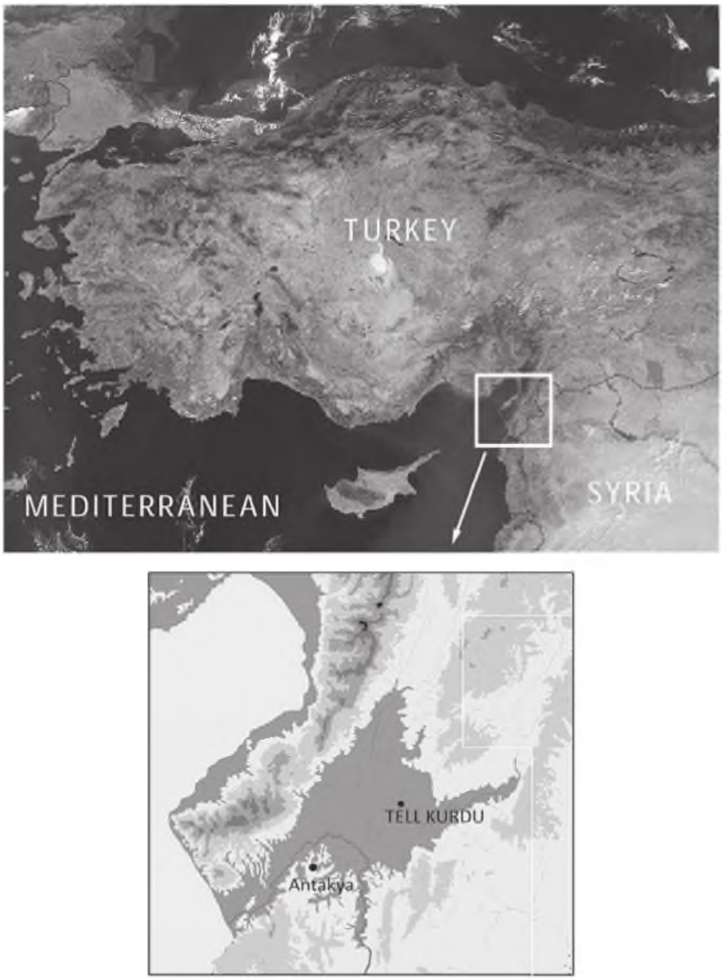

Fig. 1. Satellite image and a detailed regional map showing the location of the province of Hatay and the location of Tell Kurdu. The detailed map of the region has been adapted from a map drawn by Stephen Batiuk.

Domestic Architecture at Tell Kurdu

Tell Kurdu is a large mound, nearly 15 ha in size, located in the Amuq Valley of southern Turkey approximately 30 km northeast of the modern city of Antakya (ancient Antioch; fig. 1). The site was occupied in the 6th and 5th millennia B.C.E. Excavations took place over several seasons, with initial work in 1938 followed by further seasons between 1996 and 2001 (Braidwood and Braidwood 1960; Özbal et al. 2003, 2004; Yener et al. 2000a, 2000b). This essay discusses the area uncovered by the north mound excavations of the 6th-millennium levels, which were largely excavated in 2001 (fig. 2). In the northern part of the mound, 700 square meters of intact contiguous architecture was brought to light (fig. 3). This relatively wide horizontal exposure allows for comparative analyses at the intra-site level, ideal when addressing issues at the household scale. Little is known about the settlement organization in unexcavated parts of the site. Surface surveys have determined that occupation during the 6th millennium covered the entire mound, although it has not been ascertained whether this means that all 15 ha were inhabited simultaneously or whether occupation on the mound was shifting throughout the 6th millennium.

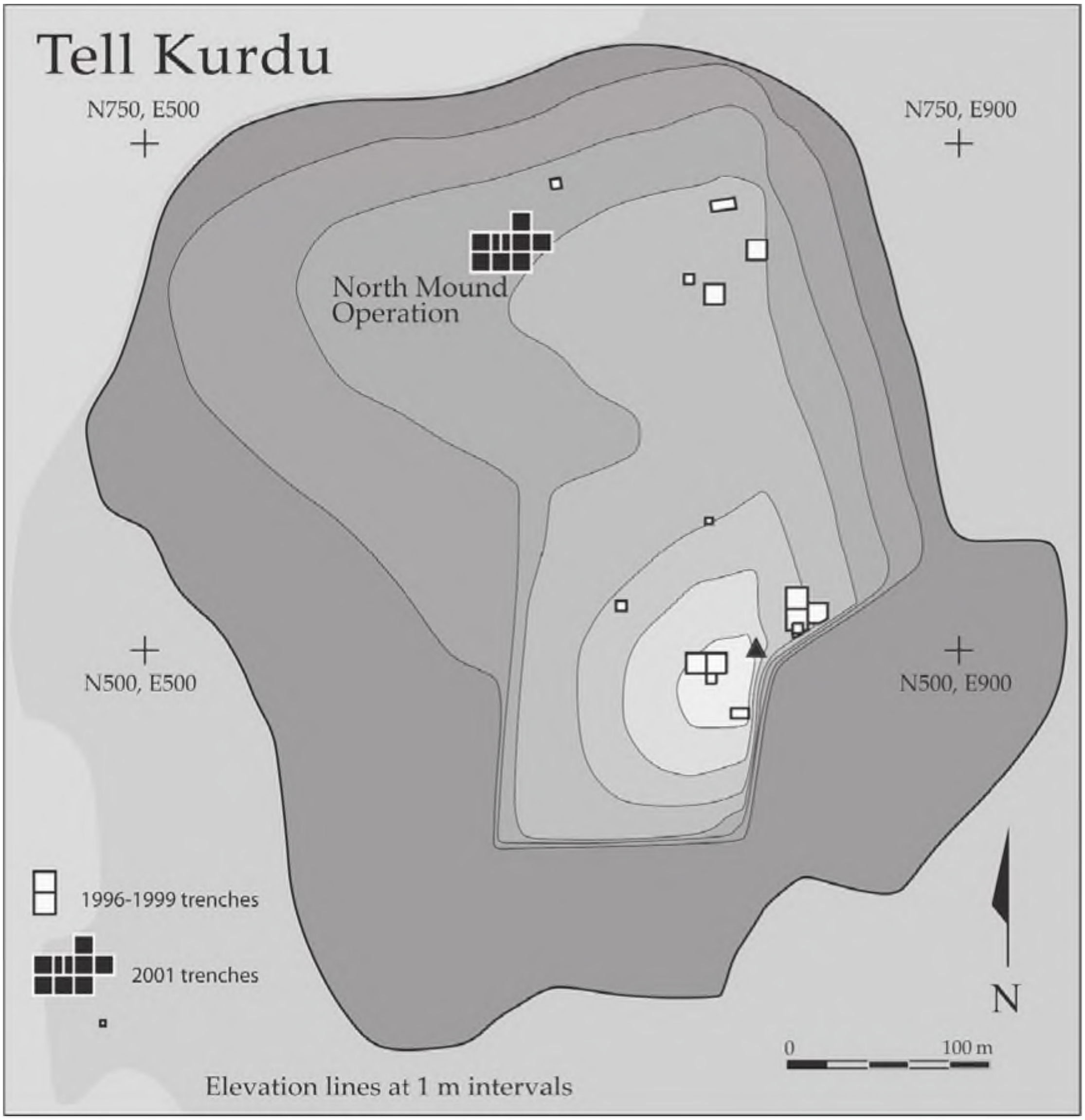

Fig. 2. Topographic plan of the mound, showing the excavation trenches.

The ceramic assemblage suggests that the inhabitants during this phase were influenced by north Mesopotamian styles of vessel production and decoration, evident by the Halaf-like motifs and shapes. These painted vessels contrast sharply with local dark-faced burnished vessels, which represent a tradition that was practiced in the region since the Ceramic Neolithic. By the 5th millennium, occupation on the mound shrank to about 5 to 7 hectares and shifted to the southern part of the site. North Mesopotamian influences continue in this phase as well, when Ubaid-like ceramics dominate the assemblage and local styles of burnishing almost completely disappear.

Streets acted as navigable arteries through the dense cluster of houses at Tell Kurdu. A two-meter-wide main street ran southwest–northeast across the excavated

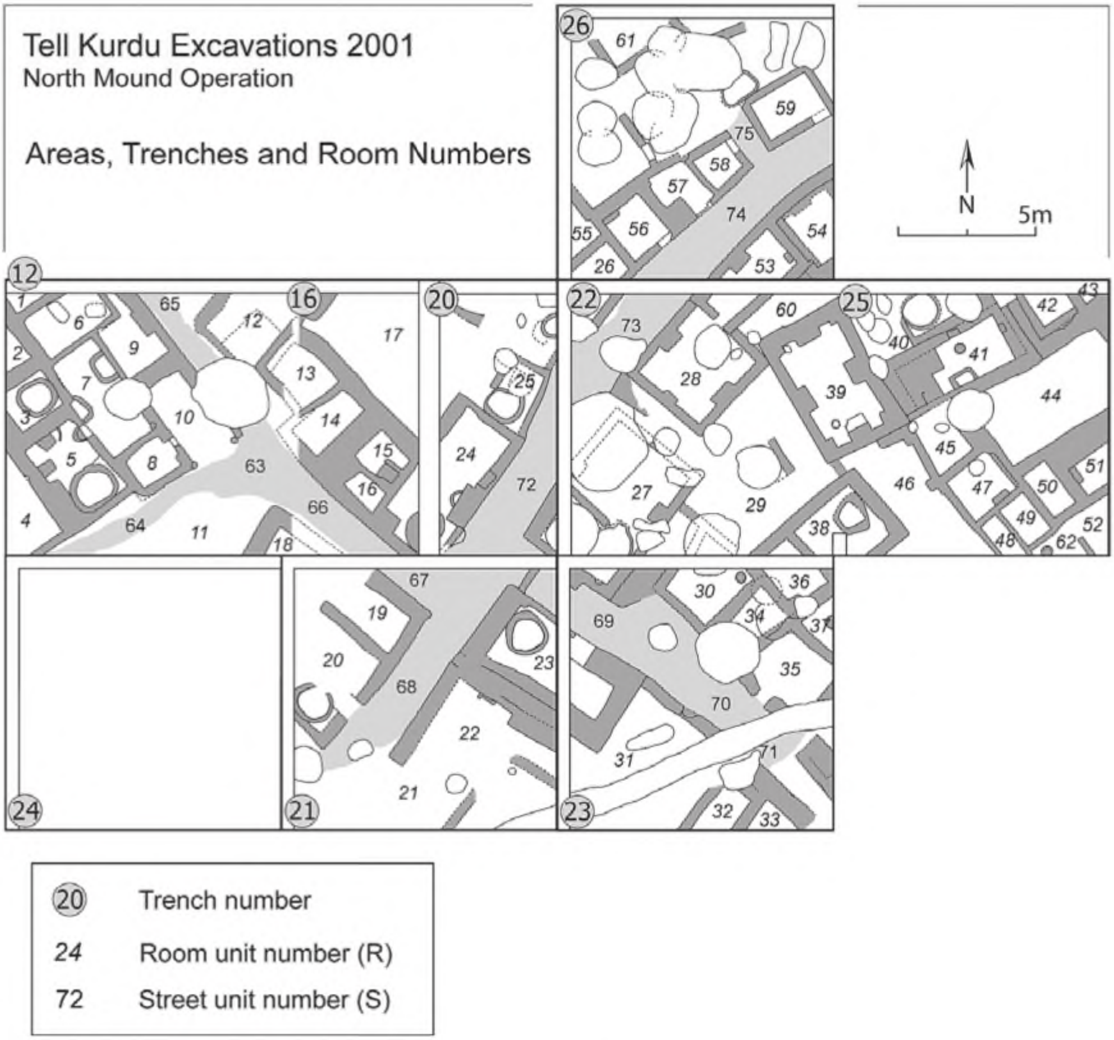
Tell Kurdu Excavations 2001
North Mound Operation
Areas, Trenches and Room Numbers
N
5m
12
16
20
22
25
26
24
21
23
20 Trench number
24 Room unit number (R)
72 Street unit number (S)

Fig. 3. Architectural plan, showing the north mound operations.

area, while smaller alleys branched off, usually at right angles in different directions (fig. 3). Being packed with domestic refuse, these streets are greenish-gray in color, making them easily and unmistakably distinguishable from the surrounding mudbrick architecture (fig. 4a).

Excavations in this area yielded a variety of structures comprising more than 60 indoor and outdoor spaces (rooms/buildings and courtyards; see fig. 3). Overall, the settlement plan shows considerable spatial complexity and differentiation in the layout of various quarters of the neighborhood. With the exception of two structures (R28 and R39), the exposed architectural remains represent a single occupational level, although differential rates of renovation, modification, and replastering mark multiple architectural phases (Özbal et al. 2004; Özbal 2006). These changes are natural in any settlement inhabited over a number of generations. In addition, the plan includes some structures (such as R30, R35, and R46) that appear to have been abandoned and/or turned into trash lots while the remainder continued to be inhabited.

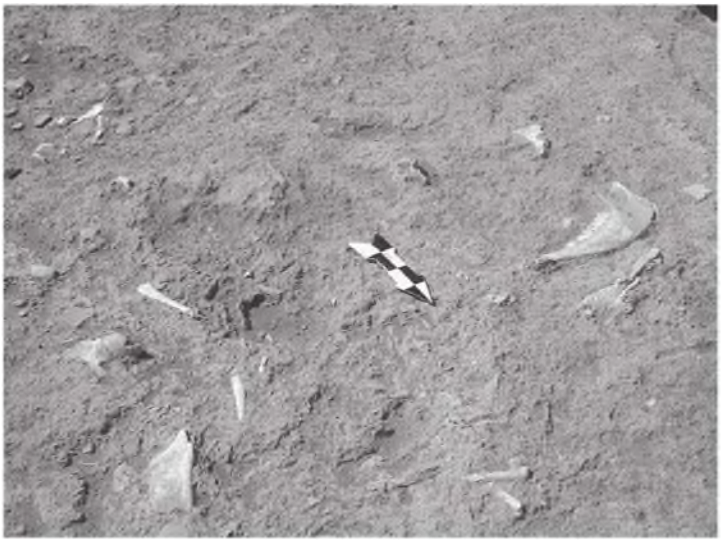

Fig. 4. Photo showing a collection of the refuse in the streets.

The variability in house type may be partly a result of the fact that some structures could have supported a second storey, thus doubling the use-space in some areas. However, the location of the architectural features and the positioning of the artifacts within rooms is of little help when it comes to ascertaining whether the structures at Tell Kurdu were single- or multistoried buildings. Carol Kramer's (1982: 132) ethnoarchaeological research in rural Iran determined that the walls of mud-brick structures require a thickness of at least 60 to 100 cm to support a second-storey superstructure. This exceeds the general thickness of most structures at Tell Kurdu. Our excavations did yield some rooms (R28 and R39), however, that have buttresses on their interior wall faces and others (R23) with at least one exceptionally thick wall (close to 2 m in the widest part). These data suggest that at least a few of the excavated structures may have been equipped with the necessary reinforcement to hold an upper storey.[2]

The variability of buildings at Tell Kurdu is not limited to the settlement level but can even be found at the level of individual structures. Room sizes in the exposed settlement range from approximately 1 to 10 square m. Some structures include installations such as ovens, hearths, bins, platforms, benches, buttresses, niches, and stepped doorways, and others lack fixed features of any kind. Several types of fire installations (ovens and hearths) can be found at Tell Kurdu, including walled, circular ovens (R05), keyhole-shaped ovens (R27), rectangular hearths (R15), and simple fire-pits (R30, R41). Bins and platforms (R05, R07, R24, and R41) similarly come in a variety of shapes and constructions. Courtyards of differing sizes also appear irregularly across the exposed settlement (R07, R29, and R44).

Mud brick is the preferred building material at Tell Kurdu, but one does occasionally find pisé constructions. Though rare, wall plaster can be found on inner and/or outer wall faces of some structures. Plaster can also be applied to floors, but most floors are constructed of beaten earth. Any kind of standardization of doorways is absent. In a few cases (R05, R08, R23, R35, R57, R59), excavations yielded clear entrances but, in most cases, doorways were difficult to identify (for example: R07, R28, R39, R41, R47, R50). We therefore suggest that access into the latter rooms was probably from doorways with raised thresholds—a common practice to prevent dust and other debris from entering houses (Simpson 2004: 233). Unfortunately, the lack of clear entrances prevents us from reconstructing patterns of access between different spaces (Hillier and Hanson 1984).

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[2] At Tell Kurdu overall, room fill deposits lack evidence for second-storey collapse. Also, features such as stairway shafts known from sites like Tell Madhhur (Roaf 1989: 92), Değirmentepe (Gürdil 2005: 60), and Çayönü (Özdoğan 1999: 48–49, fig. 36) have not been recovered.

Identifying households is a necessary step before comparing the various subconstituents of Tell Kurdu. Regardless of whether these are households or residential wards of another type, we must have a way of partitioning the settlement into coherent units or quarters. How then—with structures and features so variable, a plan so complex, and the doorways so ephemeral—can we achieve this? Before addressing this question, the next section provides a brief overview of the methodological techniques of soil chemistry and microarcheology, which may assist in this endeavor.

Soil Chemistry and Microarchaeology

In addition to clues gathered through investigating the architecture and other fixed features, living floors were sampled chemically and microarchaeologically in an effort to disentangle the intricacies of settlement organization at Tell Kurdu. These methods function as a complement to bottom-up perspectives to provide further information about the activities occurring in particular spaces. When successful, they offer insights into social activities and may inform us about group dynamics. Both microarchaeology and chemical characterization of floor sediments provide contextual information that allows for more in-depth analyses of activity areas and spatial reconstructions. These micro-techniques are extremely valuable, since often the only available evidence that an activity took place in a given locale may be its microscopic or elemental traces.

I define "microartifacts" as small artifacts and fragments less than 1.5 square cm in size that became embedded in floors and occupational surfaces (see also Cessford 2003; Clark 1985; Fladmark 1982; Madsen 1992; Özbal 2000; Rainville 2000, 2001; Rosen 1989, 1991, 1993; Sherwood et al. 1995). Microartifacts are found by sorting the heavy fractions (i.e., the part that does not float) of wet-sieved soil samples. At Tell Kurdu, 800 L of soil were wet-screened, the resulting heavy fractions were sorted, and nearly 60,000 microartifacts were recorded. Our assumption is that the relative quantities of microartifacts in architectural spaces such as public courtyards, hallways, and more private rooms directly represent the degree of daily maintenance/cleaning and may provide evidence for lithic- and shell-working and for localized episodes of burning (Middleton 1998; Özbal 2004a, 2004b). Microartifacts also provide a means of recovering the micro-fauna, such as small fragments of fish, bird bone, and eggshell, which are often not collected in macro-faunal analyses.

The chemical characterization of floor sediments, also referred to as soil chemistry, is a second method of analyzing the micro-traces of activities conducted at Tell Kurdu. A number of scholars have shown that the spatial locus of various activities such as craft production, cooking, food preparation, and animal husbandry can be identified through the chemical signatures they leave on earthen floors (Eidt

1973, 1977; Konrad et al. 1983; Middleton 1998: 121; Middleton and Price 1996). Phosphate has often been, and continues to be, considered one the most important markers of anthropogenically modified sediments (Ball and Kelsay 1992; Hammond 1983; Manzanilla and Barba 1990; Parnell et al. 2001; Parnell and Terry 2002). Using Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES), it is possible to enlarge the elemental suite considerably and to analyze quantitatively the compositions of 10 or 12 elements simultaneously (Middleton 1998; Middleton and Price 1996; Middleton et al. 2005). Since the elemental suite used for these analyses has been selected especially for their sensitivity to anthropogenic activities, analyses conducted with ICP-AES are often far more revealing than the results obtained only through extractable phosphates. In other words, a combined analysis of multiple elements, including (but not limited to) phosphate, can provide a more accurate picture of the types of activities that could have taken place on living floors. Sediment samples were collected from all the floors, streets, and courtyards at Tell Kurdu using a 50-cm grid. The elemental compositions of a selection of nearly 400 of these samples were analyzed at the University of Wisconsin–Madison Laboratory of Archaeological Chemistry.[3]

The Challenge of Identifying Households at Tell Kurdu

Trying to make sense of various concentrations of domestic facilities requires a general breakdown of the settlement into smaller, more manageable units. The varied settlement plan at Tell Kurdu makes identifying coherent household units a difficult task. The presence of bread ovens, hearths, courtyards, and what appear to be living rooms across the exposed portion of the neighborhood suggest that all areas in question are indeed domestic and that we are not dealing with craft workshops or other nondomestic complexes. This observation addresses an important question, but the uneven distribution of the above-mentioned domestic features provides few clues about how to differentiate between different households in this complex and the varied settlement plan. Using Horne's suggestion of living rooms provides little assistance because there appears to be considerable variability between rooms that could have functioned as living spaces.

Streets acted as routes of communication through the 6th-millennium neighborhood at Tell Kurdu. While it cannot be ascertained whether the inhabitants traversed their neighbors' rooftops to get to their destination, as ethnoarchaeological case-studies from central-western Iran show (Kramer 1982: 88), they regarded through-streets as communal property. An important indication supporting this interpretation comes from microartifact analyses. The contextual assessment of the "cleanliness index" or the density of all microartifacts per liter of soil shows that rooms, on average, are notably cleaner than courtyard and trash deposits and three times cleaner than streets (fig. 5). Being communal, streets were not maintained with the same care as the indoor and outdoor spaces within the house complexes. Because streets were part of the collective lives of all inhabitants, they fall beyond the spatial

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[3] I would like to thank James Burton and Douglas Price for the assistance they gave me during the analysis and interpretation of the data.

TYPE OF DEPOSIT	LITERS	N=	CLEANLINESS INDEX
OFFSITE	8	4	17.86
ROOM	587	209	75.67
COURTYARD	82	25	99.29
TRASH	9	3	131.78
STREET	37	10	216.83

Fig. 5. "Cleanliness Index" values (total number of artifacts per liter of soil) for microartifacts, showing how much "dirtier" streets are than other deposits. All artifacts less than 1.5 cm in size were used in the calculations represented.

zones within domestic compounds that were readily swept and cleaned. Assuming that streets were communal property may justify using them as a method of dividing the settlement into independent units or household compounds (fig. 6).

Naturally, such a division has many drawbacks, but given the lack of available information on doorways or other clues on the connectedness of rooms, all alternative methods of designating subunits across the settlement are bound to introduce a plethora of new biases arising from personal predispositions about how the architecture should be arranged. If nothing else, the streets provide a means of partitioning the settlement into a number of subunits without having to invoke personal biases while evaluating which quarter each room should be assigned to. One can argue, however, that while this system of partitioning works well for some streets, especially those that are "virtually unbroken by doorways," for others, this kind of division may be inconsequential (Banning 1997: 25). For some areas, however, the street division produces intact areas that are coherent. For Areas A and B, for example, the streets delimit clearly identifiable complexes of rooms encircling what appear to be courtyards. The streets also delineate Areas C and D as well-defined units. However, these compounds are more difficult to interpret because intact deposits were extremely close to the surface of the mound in these areas, resulting in walls that are not preserved very high and floors that were difficult to define.

While the streets may function as a means of demarcating what presumably are household units for the above-mentioned areas, they provide little assistance when trying to divide the mass of rooms in the eastern part of the exposed area. Without streets or other means of creating subunits, Area E, for example, remains quite large in comparison to other areas. As discussed above, the lack of doorways or other indications to connect a group of structures together makes determining boundaries between smaller subunits both difficult and arbitrary. Area F similarly may not be a coherent independent unit because it is comprised of a series of independent linearly arranged and individually accessed rooms, lacking the unity that would be expected in a co-residential compound. Moreover, although it has a hearthlike feature, it appears to lack an oven, which is part of the typical repertoire of fixtures in other areas.

The plan suggests that household organization at Tell Kurdu varied considerably. The situation here, in many ways, is not too different from that at Lee Horne's modern Iranian village of Baghestan. Some Baghestani households live in independent household complexes, where rooms may even surround private courtyards,

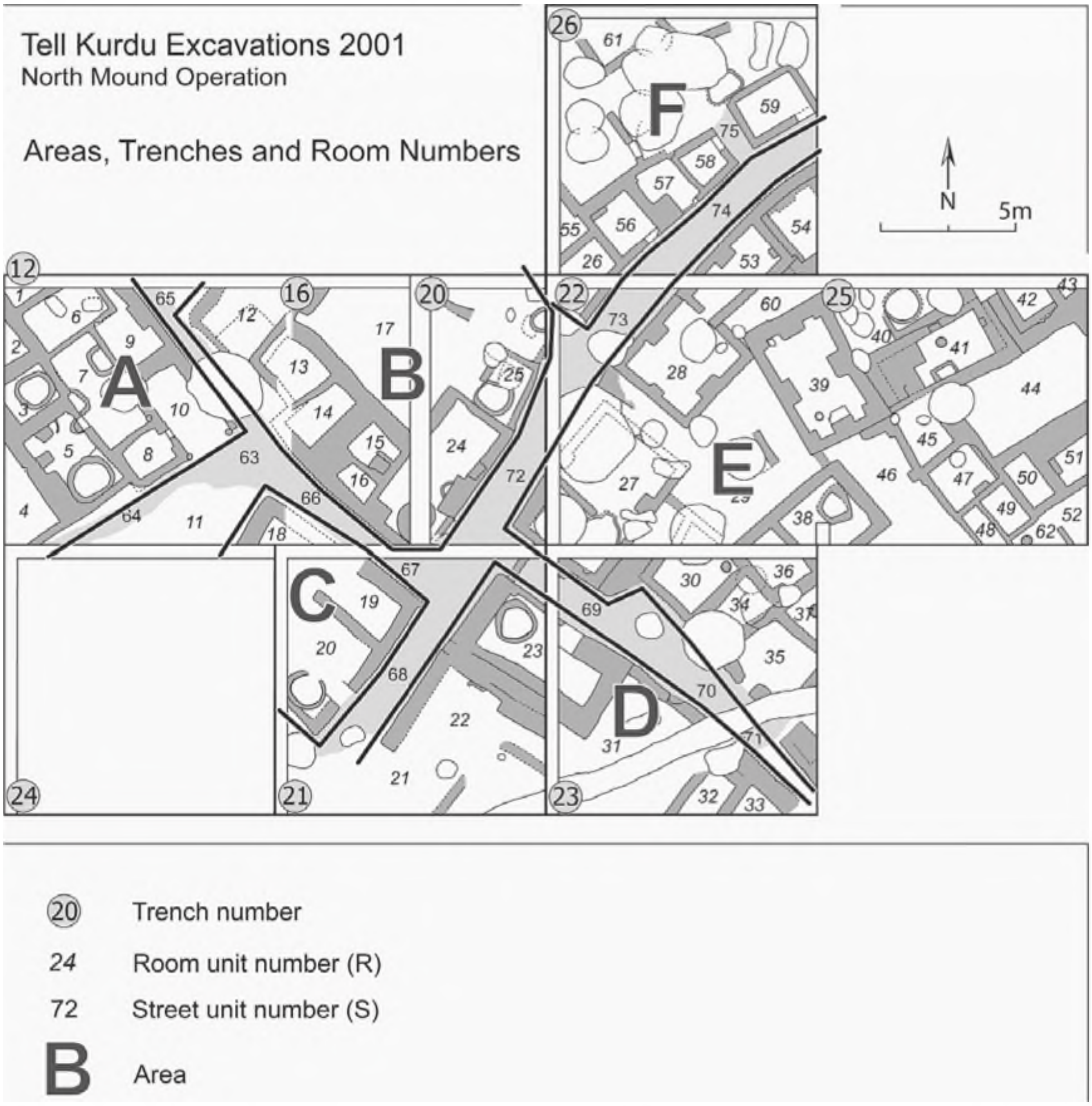

Fig. 6. Plan showing how the streets provide a basic division of the settlement into distinct areas.

similar to the situation in Areas A, B, C, and D at Tell Kurdu (fig. 7). Others, however, live in larger and more-clustered complexes where the houses in question belong to a number of different family groups (fig. 8). The wealth assessment calculated by Horne (1994: 155) suggests that the more crowded and clustered households were less well off than those with ample space and private courtyards. However, many archaeologists would argue that the 6th millennium is too early to be discussing wealth differences.[4]

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[4] The issue of social stratification and wealth differences will not be addressed here (for further references on this topic, see Akkermans 1993; Campbell 1998; Flannery 1999; Hijara 1997).

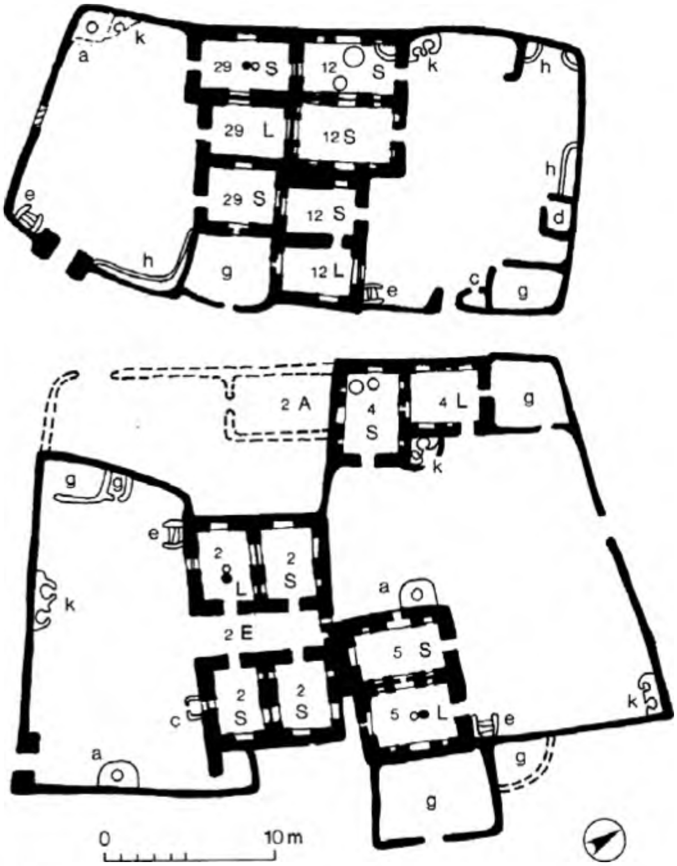

Figure A-4. Baghestan Area D. Numbers refer to owner's household. A = animal house, or stable, E = *eivān* (covered porch), L = living room, S = storeroom, a = *tanur* (bread oven), c = chicken coop, d = privy, e = *tālār* (milk product storage rack), g = sheep or goat pen, h = feed trough, k = *kalgāh* (cooking hearth). The single circles inside rooms are *kondus* (grain storage bins) and the small double circles are *bokhāri ferengi* (metal space heater) bases with their hearths. Construction begun after 1976 is marked with dashed lines.

Fig. 7. Illustration from Horne (1994: fig. A-4) representing private courtyard residences. The walled compounds of households 2, 12, and 29 are accessed through a private entrance. All the rooms and spaces within a given courtyard complex (such as storage rooms, living rooms, etc.) appear to belong to the same household.

Perhaps even the variability that the family cycle exhibits as it evolves from a newlywed core to a rooted multigenerational household group may account for the notable fluctuations we see at Tell Kurdu. More research and wider exposures are perhaps the only ways to address these issues further. Rather than speculating about underlying causes for household differences and the reasons for intra-site variability, the remainder of this essay will be devoted to understanding how at least one household at Tell Kurdu was organized. Insights gained through microarchaeological and soil chemical analyses help address issues of household constitution.

Household Organization at Tell Kurdu

This section assesses the dynamics of household relations and the social setting in a single coherent household and further provides insights into 6th-millennium

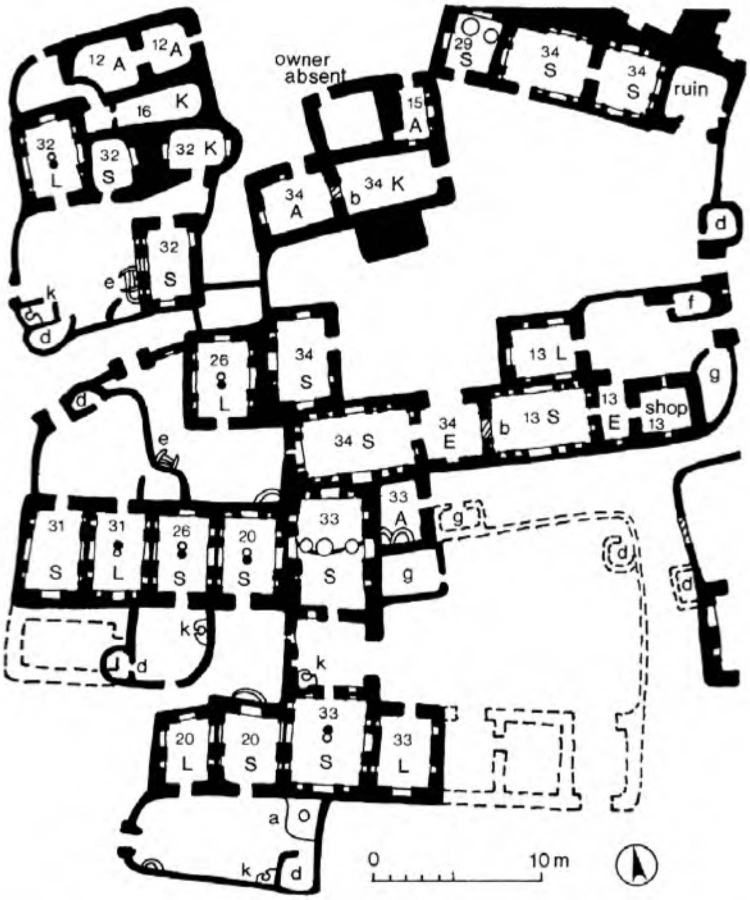

Figure A-6. Baghestan Area F. Numbers refer to owner's household. A = animal house, or stable, E = *eivān* (covered porch), L = living room, K = straw storage room, S = storeroom, a = *tanur* (bread oven), b = blocked door, d = privy, e = *tālār* (milk product storage rack), f = gravity feed shower, g = sheep or goat pen, k = *kalgāh* (cooking hearth). The single circles inside rooms are *kondu* (grain storage bins) and the small double circles are *bokhāri ferengi* (metal space heater) bases with their hearths. Construction begun after 1976 is marked with dashed lines.

Fig. 8. Illustration from Horne (1994: fig. A-6) representing a clustered household setting. Although private entrances and courtyards appear to apply to some of the households (such as household 13, 31, and 32) in this quarter of the settlement, some households (such as, for example, 20 and 26) lack courtyards with restricted access and instead have "environs" scattered across a wider area.

village life in this Halaf-related settlement from a bottom-up perspective. This viewpoint permits a scale of analysis rarely explored for Halaf-related sites, which are often placed into cultural historical narratives.

Our best example of a domestic unit at Tell Kurdu comes from Area A, located in the western part of the settlement (fig. 9). Part of the complex remains unexcavated, so the structure in question was presumably larger than what has been unearthed thus far. Access into this house was restricted to a single gateway, leaving little doubt that this was an independent residential unit. This is evident from two postholes flanking either side of the main entrance to the compound from R10, suggesting that there must have been a gate impeding free access. After entering the complex, one stepped over a raised threshold to enter the main courtyard (R07) at the heart of the complex. A third posthole, carefully positioned along the threshold to support a

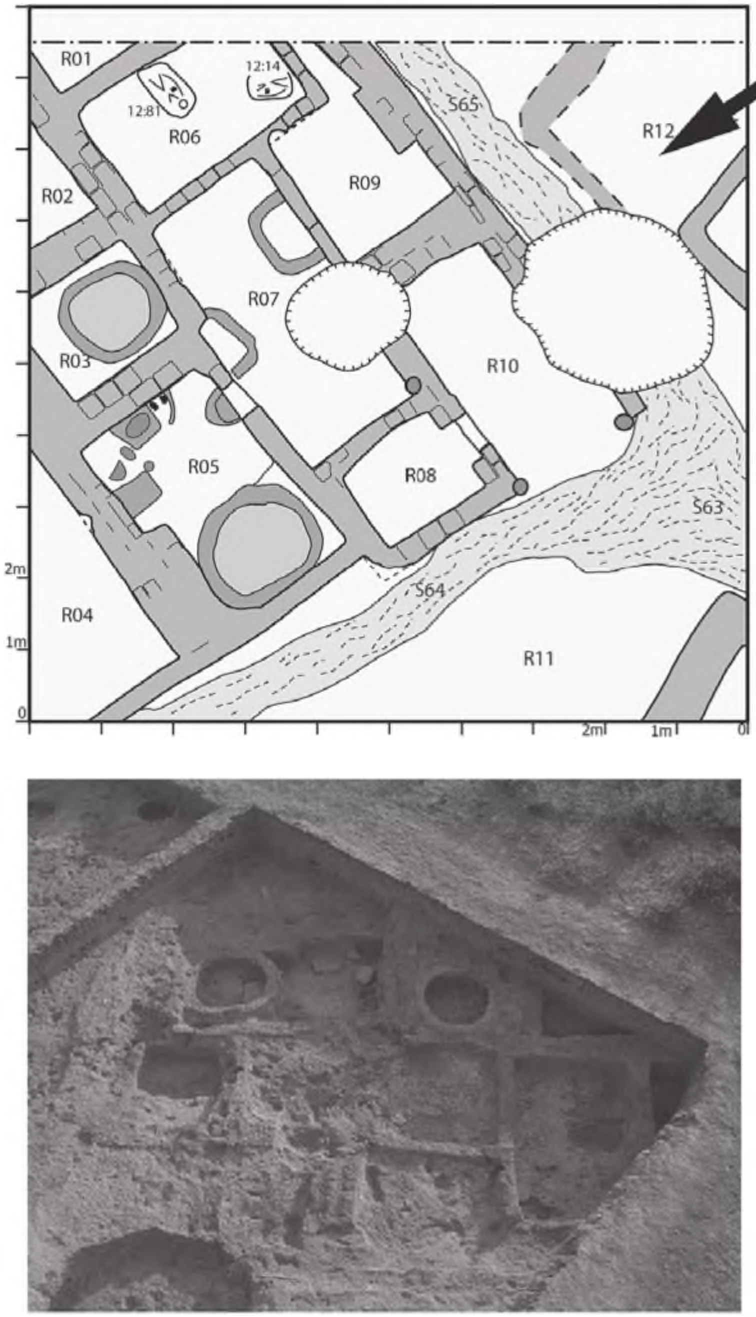

Fig. 9. Plan and photo of Area A. The arrow indicates the vantage-point from which the photo was taken.

door, would have further deterred uninvited guests from trespassing. For Baghestan, Horne demonstrates that the rooms of compounds accessed through private thresholds or gated entries tend to belong to the same household (Horne 1994: 199–208; see fig. 7). Based on this ethnoarchaeological analogy, Area A may be a coherent residential unit.

R07, the central and largest space of Area A, has two bins flanking both the eastern and the western walls of the courtyard. Based on the irregularity of the floor and the presence of burned fire-pits (Edens and Yener 2000: 45–46), this area has been

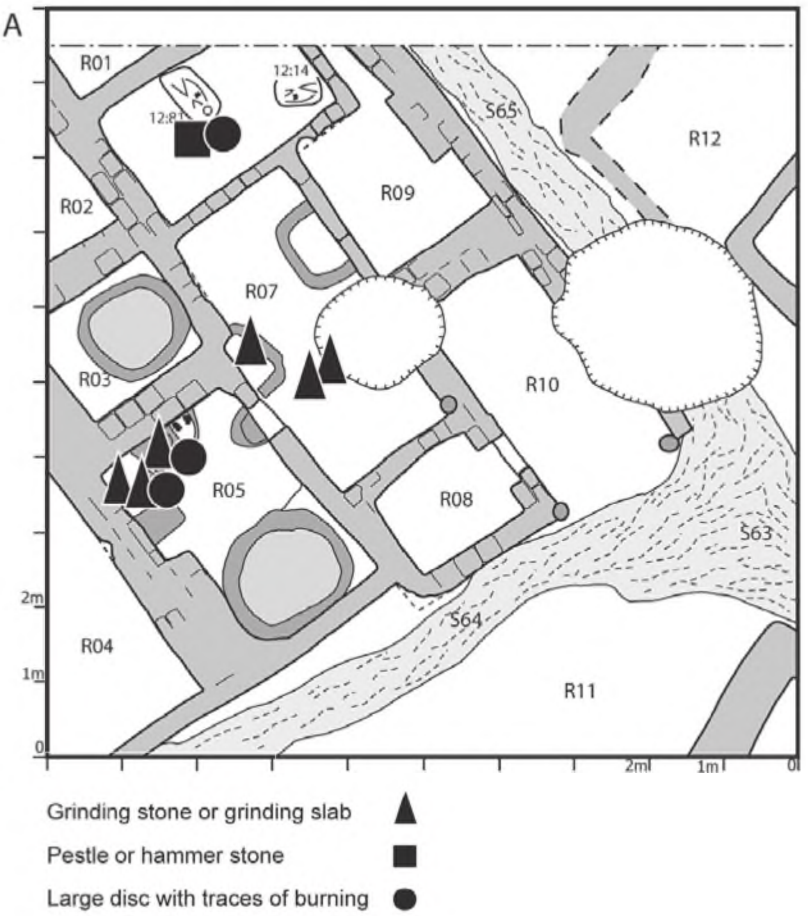

Fig. 10. Plan of area, indicating the location of the grinding-stones discovered by the excavations. In some instances, the specified locations of the grinding-stones are approximate.

interpreted as an outdoor area. Analysis of the ceramics yielded many examples of Halaf-like painted collared-rim bowls, some of which are complete or nearly complete. In fact, one was discovered *in situ* inside the eastern bin, placed upside-down above a grinding-stone. This courtyard and adjacent Room R05 yielded several grinding slabs, indicating these were areas in which foodstuffs were ground and consequently where part of the food preparation process took place (fig. 10).

Though more restricted, Room R05 was undoubtedly a kitchen. A large walled oven, several work benches, a bin, an array of grinding-stones and food-processing utensils, as well as other *in situ* artifacts such as a large vessel, a large ceramic disk, with evidence for burning on one side, may support this claim. Moreover, the discovery of tokens, spindle whorls, various bone, flint, and obsidian tools, sling pellets, and worked-river pebbles suggest that food preparation was not the only activity that took place in this room (fig. 11). Food may also have been processed in room R03 where a second large walled oven was built. This could suggest that either the ovens in Area A were seasonally used (Kramer 1982: 100) or that the household was quite large and required multiple oven facilities. Ovens at Tell Kurdu are always placed in indoor spaces. In an ethnoarchaeological study in the village of Aliabad in central western Iran, Kramer explains that outdoor ovens are difficult to manage because of problems of "air circulation and smoke dispersal" (Kramer 1982: 120), al-

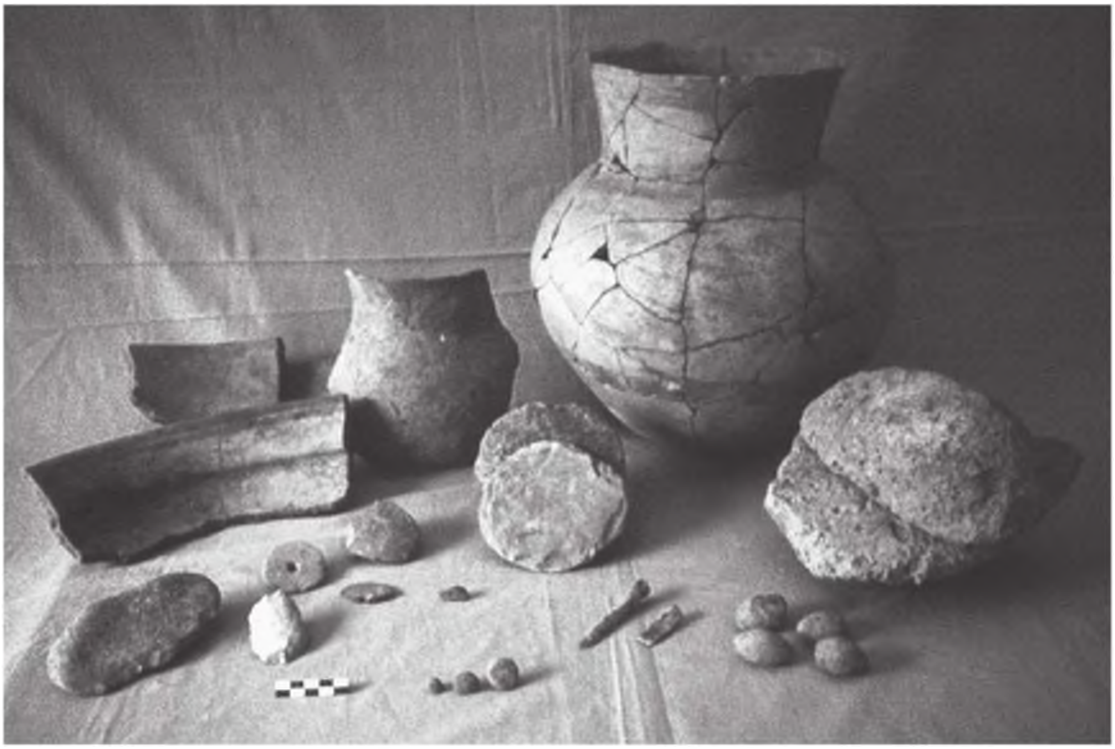

Fig. 11. Group shot of the *in situ* artifacts recovered from Area A.

though outdoor examples covered by a type of windbreak are not unknown (Parker and Uzel 2008).

The chemical characterization of soil sediments in Area A has provided an interesting means of assessing the observation that this area was used for food preparation. Surprisingly, elements that are considered the most obvious and reliable indicators of food preparation such as calcium (Ca) were unable to yield interesting patterns at Tell Kurdu, probably as a result of the limestone-rich (calcium carbonate) geology of the Amuq Region.[5] However, both R07 and R05 and other areas in the site that yielded high concentrations of grinding-stones were also high in concentrations of iron (Fe). It is possible that this pattern is a result of the intensive use of basalt grinding-stones. Basalt is an igneous rock that contains considerable amounts of iron.[6] The high concentrations may result from abrasive activities such as grinding that slowly erode the use-surface of the grinding slabs and pestles. This must have resulted from the intensive use of basalt grinding-stones over a long stretch of time, acting to reinforce the theory that grinding in these areas was a repeated activity or a practice and not simply a one-time endeavor. The heavy prolonged use that the grinding-stones from Tell Kurdu show also further substantiates this claim.

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5. Both on-site and off-site values already showed elevated values for this element (Özbal 2006).

6. Basalt is also high in magnesium (Mg). However, as in the case of calcium (Ca) described above, on-site and off-site samples show no variability in their concentrations of magnesium, so the distribution of this element across the site may be considered less reliable than others.

Food preparation, however, was only one of the many activities that took place here. Microartifact analyses show that chipped-stone tools were sharpened or knapped in courtyard R07, thus confirming the multifunctionality of space (Özbal 2004a, 2004b). This demonstrates that the household in Area A saw to its own needs when it came to producing and sharpening lithic tools. Analysis of heavy fractions yielded more than 100 fragments of like-colored yellowish microflakes, chips, and other debitage embedded in the floor of this room in localized concentrations (Özbal 2004a, 2004b; Özbal and Healey n.d.; also see Middleton 1998: 210–32). The density of micro-chipped stone in this courtyard is considerably higher than in other locations. Much more significant than the density, however, is the consistency in the shape, texture, and color of the micro-flint flakes, chips, and chunks. In other words, the quantity of chipping debris in unkempt streets may approach these values but may be comprised of an assortment of different raw materials, colors, textures, and shapes. R07 is exceptional in terms of having an even collection of freshly chipped, consistently colored flakes.

Room R06, a medium-sized room with four well-plastered floors located north of the courtyard, appears to have been the living room of this household complex. Two burials under floors that are likely to be distant in time were discovered here.[7] The later one, an adult male missing a cranium, was placed beneath the highest preserved floor, and the other was the tightly flexed skeleton of a boy 10 to 12 years of age placed beneath the lowest excavated floor (Lorentz n.d.). [8] Mitochondrial DNA analyses conducted on these individuals determined that they both belong to the same haplotype group and, hence, that they were related (Mekel-Bobrov and Lahn 2004).[9] Subfloor burials are rare at Tell Kurdu, so the presence of two beneath the same floor is noteworthy and adds importance to the room as a space of familial significance. These data may suggest that Area A, with its gated entrance and isolated nature is likely to have been inhabited by the same family/lineage over an extended period of time.

Overall, one could conclude that the inhabitants of Household A were an independent group that prepared, cooked, and consumed their own food within their private compound. The restricted access, their personal kitchen and living areas, and the ancestral ties provided by the DNA data give the impression that this was a long-lived exclusive household complex. Evidence suggests that this self-sufficiency extended to the storage facilities as well: room R08, near the entrance of the compound is only 2 square m, which suggests that it could have served as little other than a personal storeroom for the residents' private property or foodstuffs. Together, these data add to the independence that Area A displays and suggest that the household sphere was the central arena for many facets of daily life.

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[7] This interpretation is based on stratigraphic clues from Area A (Özbal 2006).

[8] The skull may be missing either because it was removed by a plow or perhaps because it was kept separate for ritual reasons. See, for example, Cauvin 1980; Kenyon 1957: 72; Kuijt 2000; Öztan 2002; Stordeur 2000.

[9] Additional DNA evidence is necessary to support this claim (see Özbal 2010).

Conclusions

Rather than beginning from the culture-historically defined society in question, household archaeology encourages investigations of daily activities and fosters a bottom-up approach. This moves the focus from grand scenarios about how the past may have unfolded to small insights on everyday routines. Minor facts about habitual tasks and details on how inhabitants prepared and shared meals, where they conducted crafts, where they buried their family members, and how they set up spatial divisions across their compounds are in many ways valuable threads of information. Changes or incongruities in household organization noted at this finer scale may be related to shifts in larger political, economic, or social arenas of society. This approach is especially appropriate for Tell Kurdu, because this settlement falls within what has traditionally been considered the Halaf sphere of influence. The Halaf Phase in general has often been subject to top-down formulations, and a household perspective may add a fresh perspective toward gaining new insights in discussions of interregional connections at this time (Akkermans 1996; Bernbeck and Pollock 2003; Campbell et al. 1999; Verhoeven 1999).

A major hurdle household archaeology faces in the Near East or Anatolia, however, is correlating physical structures with households. Ultimately, the insights that this subdiscipline provides on how inhabitants constructed, maintained, changed, and/or challenged their social relations and cultural identities are only useful if and when we can identify comparable domestic units across a settlement. At Tell Kurdu, using the streets to subdivide the settlement provides a way of dealing with this problem. The discussion in this chapter has illustrated both the advantages and limitations arising from this division. On the whole, it does seem to be an appropriate means of identifying domestic clusters in at least some cases, such as Area A.

A detailed analysis of the activities that took place in Area A suggests that the inhabitants of this double-gated residence preferred a residential compound that was somewhat more private. Furthermore, we can conclude that the house was an important arena in which daily and routine tasks took place in the 6th millennium B.C.E. at Tell Kurdu. The discovery of two subfloor burials suggests that the house must have carried social significance and was more than a physical structure. The residents of Area A appear independent in many respects; they prepared and cooked their own food within the compound. If collared-rim bowls are considered serving vessels, the high percentages found here could indicate that they ate together in the central courtyard. Moreover, they appear to have had their own private storeroom for the storage of goods, and the discovery of lithic production or sharpening debris further suggests that the residents saw to much (or part of) their own craft production. Overall, these insights about the residents of this area suggest that they were socially autonomous, economically self-sufficient, and inwardly-directed.

The lack of public connections between Area A and other areas is noteworthy. Small-scale communal crafts facilities (Campbell 2000; Davidson and McKerrel 1976, 1980), corporately-used storage compounds (Bernbeck and Pollock 2003; Merpert and Munchaev 1993a: 140; Verhoeven 1999: 188), and other supra-household institutions (Oates 1977; Watson 1983) that, by definition, would require settlement-wide integration were not unknown in the Near East at this time. Intra-settlement connections were undeniably also present at Tell Kurdu. In fact, the variability that is recognizable from the architectural plan of the 6th-millennium levels suggests that other parts of the neighborhood were organized differently. This is evident from the lack of private gated entrances and secluded compounds, which imply that inhabitants residing in other areas may have followed a different logic with regard to intra-communal interaction than those of Area A. One would not expect this variability or the seclusion of Area A to be disconnected from larger social, political, and economic processes and dynamics. The ramifications, in other words, of an in-depth analysis of the activities in a single household, like that of the residents of the area in question, could take us beyond the residential sphere and have the potential to enlighten aspects of social organization at a grander scale.

Acknowledgments

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The Life of the Majority:
A Reconstruction of Household Activities and Residential Neighborhoods at the Late-Third-Millennium Urban Settlement at Titriş Höyük in Northern Mesopotamia

Yoko Nishimura

Household archaeology is not simply finding and defining socioeconomic contributions of historically underrepresented segments of a population (e.g., women, children, elderly), nor is it about investigating humble structures at small sites simply because splendid palaces and temples are not present or available to be excavated. Household archaeology is an essential archaeological endeavor that places a strong emphasis on society's smallest socioeconomic unit—the household—to reconstruct ancient communities from the perspectives of the majority of their inhabitants. As such, its significance multiplies when we study households in the context of the larger settlement as a whole. When investigating ordinary houses, we have to remember that they are likely to be the structures that filled out most of the occupied area of the ancient settlement and provided the context for the lives of the vast majority of its inhabitants. Nevertheless, our view of ancient cities has often been derived from public architecture and the writing of the elite population. These reconstructions of ancient society are inevitably skewed toward the interests and views of the select few. Household archaeology, with its more proportionate focus on the lives of non-elite inhabitants, results in a more holistic and balanced understanding of societies in the past. By making full use of the multiple recurrence of the household unit within a settlement, we can realize the full potential of household archaeology. It is the nature of this recurrence that leads us to the investigation of similarity and variation in social, economic, and symbolic aspects of households at the levels of residential quarters or a settlement as a whole.

Over the past three decades, scholars have arrived at rich theoretical developments in household archaeology. These major developments have involved arguments regarding correlations between archaeological remains and past human behavior, the need for general models and principles drawn from other disciplines, the use of ethnoarchaeological analogies, and the study of site-formation processes. One of the most important developments is the widely accepted definition of the household as an activity group that shares domestic activities, often at a shared residence (Blanton 1994: 5; Rani 1999: 78; Wilk and Rathje 1982: 618; Wilk and Ashmore 1988: 6).

With this basic definition established, in more recent years, archaeologists have carried out an increasing number of studies encompassing a larger variety of social and symbolic aspects of households, including power and gender relations, social and symbolic use of space, and relations between households and the state (Bailey 1990; Bradley 2005; Brusasco 2007; Donley-Reid 1990; Doonan 2001; Düring 2007; Hendon 1996; Nanoglou 2008; Nevett 2005; Oetelaar 2000; Rodríguez 2006; Souvatzi 2008; Steele 1992; Wattenmaker 1998; Westgate 2007a, 2007b).

However, substantial methodological progress or consensus among researchers regarding the interpretation of patterns observed in household remains has not accompanied the recent expansion of thematic focuses in household research. Most of the diversity in household studies is built upon formal and functional studies (including activity-area analyses) of exemplary or archetypal households within settlements. These formal and functional studies often include analyses of the quantitative distribution of functionally diagnostic household objects and represent the first and indispensable methodological step toward the examination of other aspects of daily life.

To keep up with the rapid growth of research questions and theoretical orientations in household studies, it is thus essential to bring methodological refinements to this basic analytical step. The systematic examination of the quantitative distribution of domestic material remains across multiple houses and neighborhoods must be the most significant of such refinements. Rather than examining the distribution of household material culture on a house-by-house basis, we should examine the distributive patterns more systematically across houses and neighborhoods so as to identify overall patterns that are likely to be consistent over larger residential quarters. We also need to establish explicit methods for assigning meanings to the observed patterns of domestic material remains.

In recent years, moreover, an increasing tendency observed in such household analyses has been the incorporation of more diverse and larger amounts of excavation data from household remains, especially macro- and micro-level artifacts such as ceramic, lithic, and bone material. This tendency reflects the growing availability of new statistical and laboratory techniques and represents another promising methodological advance in household studies. Therefore, the refinements to the first methodological step in household studies include not only the systematic treatment of household material remains across houses but also the incorporation of broader varieties and larger quantities of macro- and micro-level household remains in the investigation. We can greatly enhance such refinements by utilizing statistical and quantitative computer techniques.

When we enlarge the area of coverage, we also make methodological refinements in household studies. This places households in the context of the larger settlement, especially urban settlements. Excavation data are to be used in conjunction with other types of data, such as surface and subsurface surveys, that cover much of the remainder of the residential quarters. In so doing, we have to establish an explicit link between excavation and survey data, explicating how representative the excavated areas are vis-à–vis the rest of the residential neighborhoods at the settlement. Without this final step, household archaeology may remain confined to the household level and we may not be able to view the result of the systematic investigation of household material culture at the settlement level.

With these methodological refinements in mind, I aim to show how we observe a systematic analysis of daily activities and use of space within non-elite domestic structures at the late-third-millennium site of Titriş Höyük, both at household and settlement levels. Wide horizontal excavations and extensive magnetometry surveys carried out in residential neighborhoods make this sort of observation possible at this site. Titriş is one of the few early sites in northern Mesopotamia for which such diverse data are available for a non-elite urban population. Based on the wealth of household remains exposed at this urban settlement, I attempt to reconstruct the daily activities. Incorporated in this analysis are various architectural and spatial factors, built-in features, small finds, lithic debitage, animal bones, and ceramic sherds obtained from the floor levels within the excavated houses. I then extend my research to show how the picture of daily life within the excavated houses and neighborhoods illuminates the general life of the bulk of the ordinary urban population at this site. Magnetometry surveys covering almost half of the lower city revealed traces of architectural plans and streets throughout the settlement. Through the combination of the excavation data and geomagnetic results, an overall picture of the urban layout at Titriş comes into view. This is the first attempt to apply systematic reconstruction of household activities to the understanding of broad urban life among the non-elite population as a whole. As I establish the daily activities and spatial organization within the excavated houses as general patterns across the residential neighborhoods at Titriş, I explore further socioeconomic issues, including urban spatial organization and economic hierarchy among the houses and neighborhoods.

Titriş Höyük

Early urban centers emerged and rapidly grew in northern Mesopotamia and its surrounding regions in the middle centuries of the third millennium B.C.E. (fig. 1). The majority of the inhabitants of non-elite status occupied extensive residential neighborhoods within these early cities, many of which were walled. Although somewhat smaller than other cities in settlement size—approximately 35 ha—Titriş was among the early urban centers in northern Mesopotamia. This urban settlement was situated on the north bank of the Tavuk Çay, a small tributary of the Euphrates (fig. 2). According to geomorphological investigations, a second tributary, now dry, flowed past the settlement to the north at least during the first half of the third millennium B.C.E. (Algaze et al. 1995: 32–37). The settlement has an oblong shape, with the High Mound (ca. 3 ha) located in the south. Two Lower Towns flanked the High Mound on the east and west, and the Outer Town spread to the north from the High Mound.

Archaeological surveys and excavations at Titriş Höyük took place between 1991 and 1999 under the co-direction of Guillermo Algaze of the University of California, San Diego, Adnan Mısır of the Şanlıurfa Arkeoloji Müzesi, and Timothy Matney of the University of Akron (Algaze et al. 1992, 1995, 1996, 2001; Algaze and Mısır 1993, 1994; Matney et al. 1997, 1999). Horizontal excavations totaling 2500 square m exposed two non-elite residential sectors located at opposite ends of the site, about 900 m apart (A and B in fig. 2). These excavations brought to light 13 completely

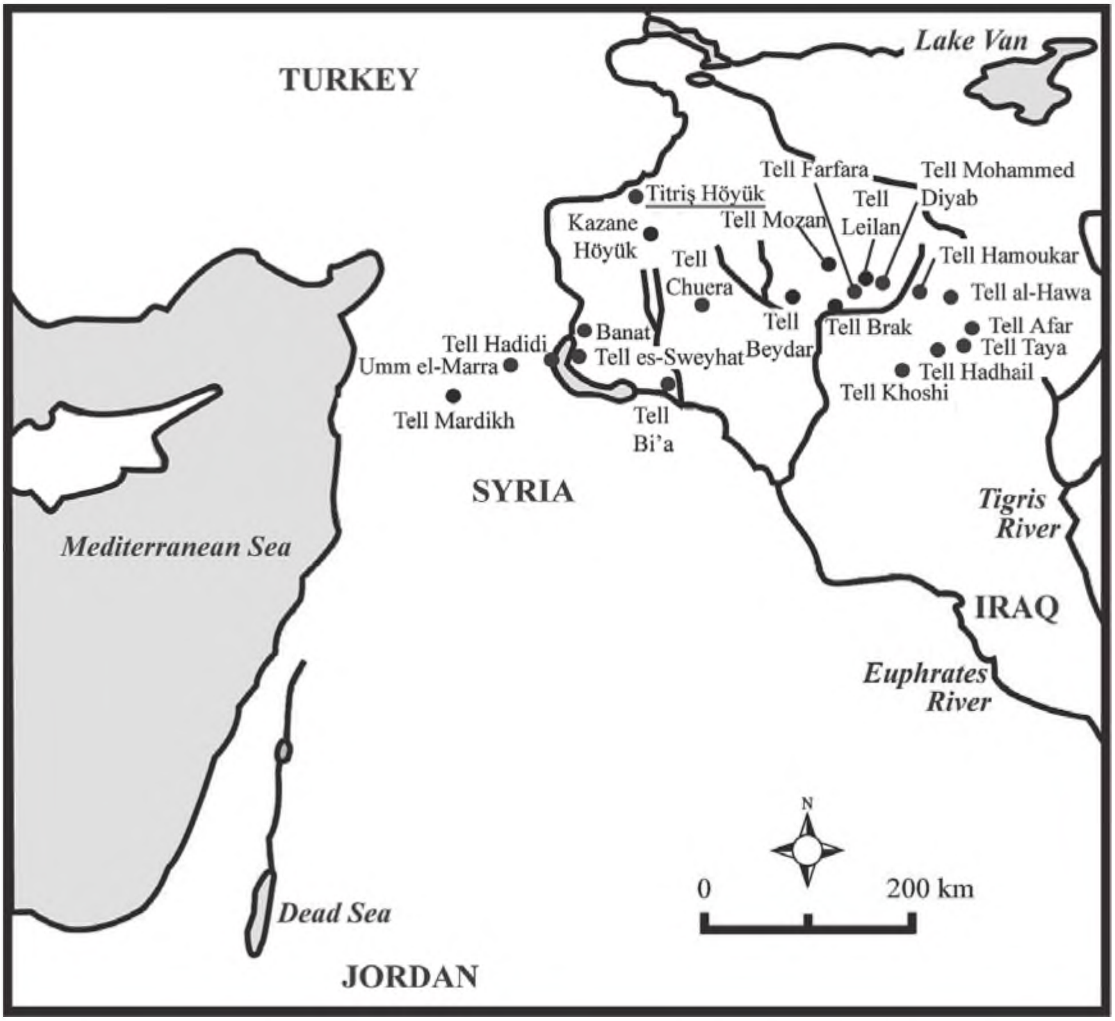

Fig. 1. Third-millennium urban centers in north Mesopotamia and its vicinities.

or partially exposed residential structures in the two contemporaneous neighborhoods (fig. 3). Among the 13 houses, 5 rectangular houses were almost completely excavated: Houses 1, 2, 3, and 4 in the Outer Town and House 5 in the Lower Town. Houses 2, 4, and 5 were central-courtyard houses, a very typical house plan in the region to this day. This house-type had at least one large central courtyard surrounded by a single ring of smaller rooms on all sides. Access to these smaller rooms was usually directly from the courtyard.

Based on the combination of the results of architectural analysis and radiocarbon dating, the excavators argue that the city dwellers constructed all the residential structures during a comprehensive rebuilding of the settlement that took place around 2300 B.C.E. (Matney et al. 1997: 70; Matney 2002: 24–27). When the period of urban decline began in northern Mesopotamia after 2100 B.C.E., the city dwellers at Titriş also abandoned much of their settlement. They seem to have gradually abandoned their houses in the lower city, and nobody reoccupied the houses subsequently (Algaze et al. 2001).

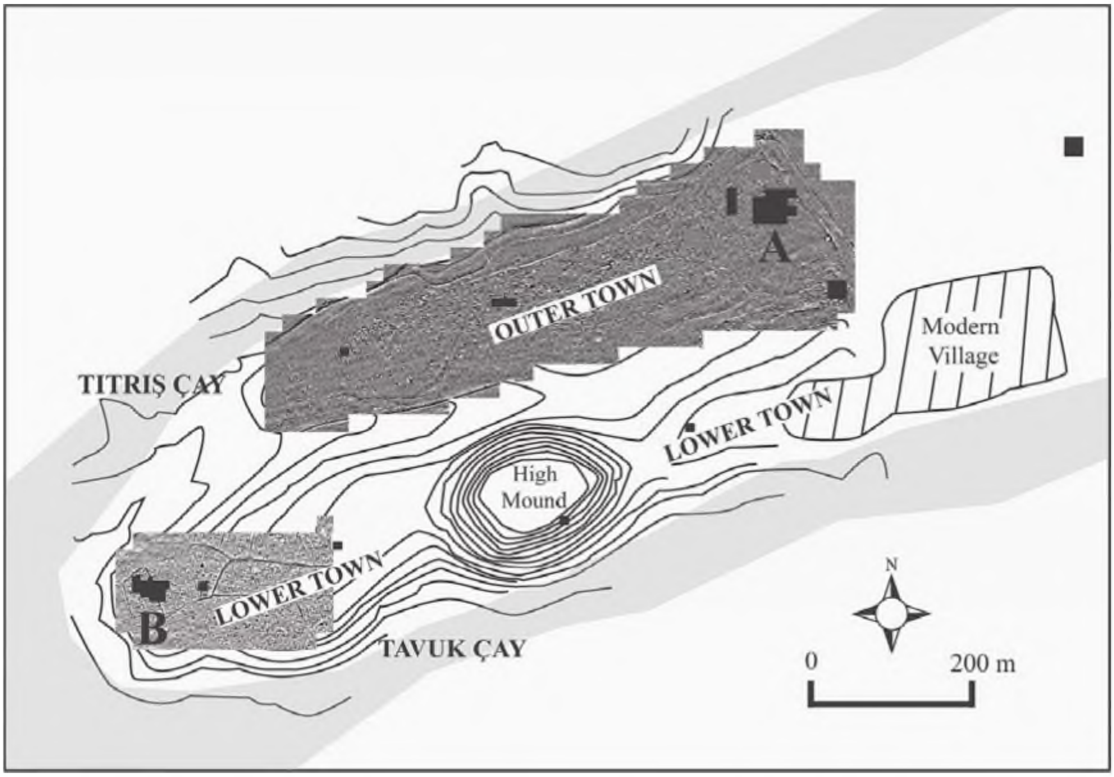

Fig. 2. Site plan of Titriş Höyük, with areas where magnetic field gradient surveys were conducted. The excavated areas are shown in black. A and B are two extensively excavated areas.

The house plans that I used for the systematic analysis, therefore, were those of the period of the centrally-planned construction of the residential areas, since this is the only phase when we know that the architectural plans were roughly contemporaneous across different rooms and houses. Although many of the excavated houses shared similar house plans and numbers of rooms, there was a relative flexibility in choosing a house plan. The city inhabitants built these houses contiguously, the houses sharing dividing walls between them. None of the houses was a free-standing structure.

These structures were private houses, lacking the architectural features and artifacts that are often associated with public buildings, such as thick walls with decorative niches, religious altars, podiums, and record-keeping devices. The material remains and features within these houses were largely domestic in nature, including ovens, grinding stones, cooking pots, and garbage pits. Although relatively large in size, these domestic structures were not elite residences, since the two areas that contain these houses were both located at the peripheries of the city; nonetheless, these houses show considerable similarity in terms of both architectural features and artifacts recovered from them. Items distinctively associated with elite status were also absent, though the occupants may well have removed such valuable items when they abandoned their houses.

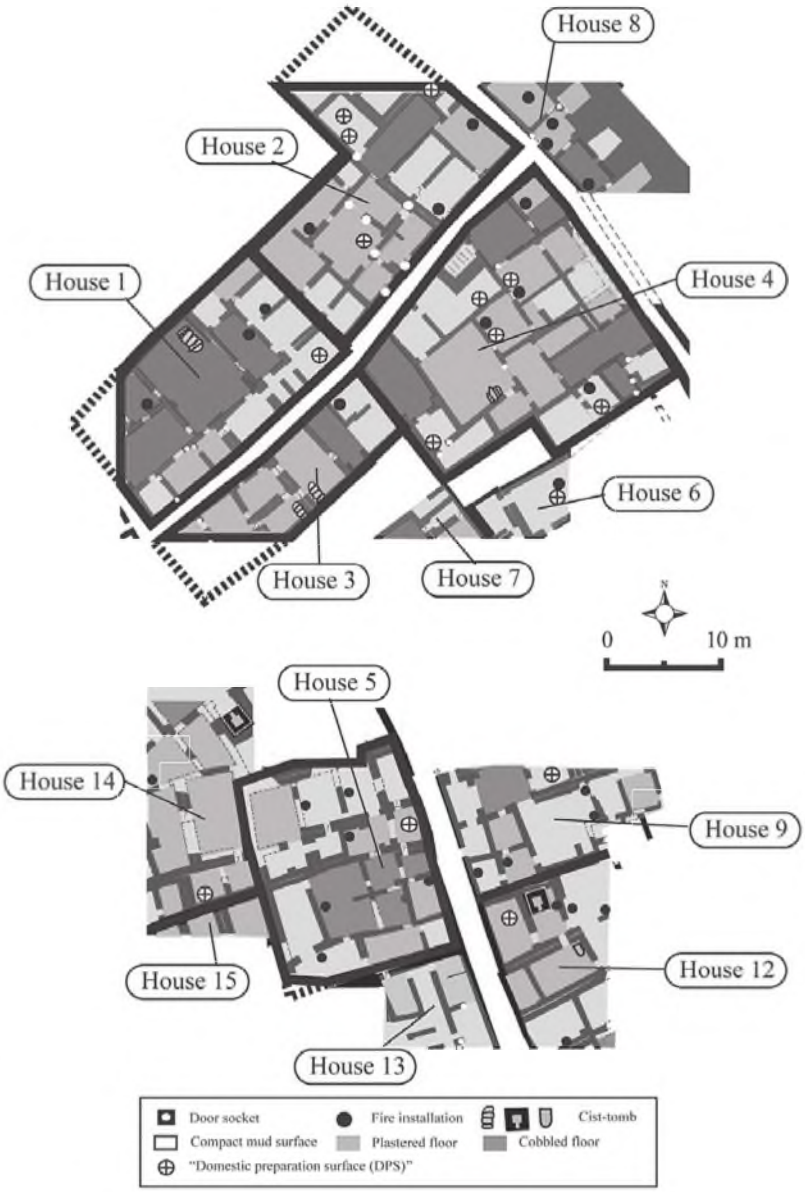

Fig. 3. 13 excavated houses with features used in hypothesizing room function in the Outer Town (top) and Lower Town (bottom).

The excavators recovered large amounts of diverse household remains from the floor levels of these 13 private houses. The remains could potentially have gradually accumulated at the house floor-levels from the time of the initial construction of the houses around 2300 B.C.E. In particular, there would likely have been an accumulation of small and fragmentary items that were accidentally or intentionally embedded in the floor over a long period of time while the household members occupied the houses. Larger or intact items such as complete pots, grinding stones, and figurines, on the other hand, are much more likely to have come from the end of the period of occupation around 2100 B.C.E. Most of these were nonvaluable items left behind in rooms by the former occupants when they abandoned their houses.

Between 1992 and 1994, Dr. Lewis Somers of Geoscan Research Inc. conducted magnetic field gradient surveys across much of the residential quarters at Titriş, cov-

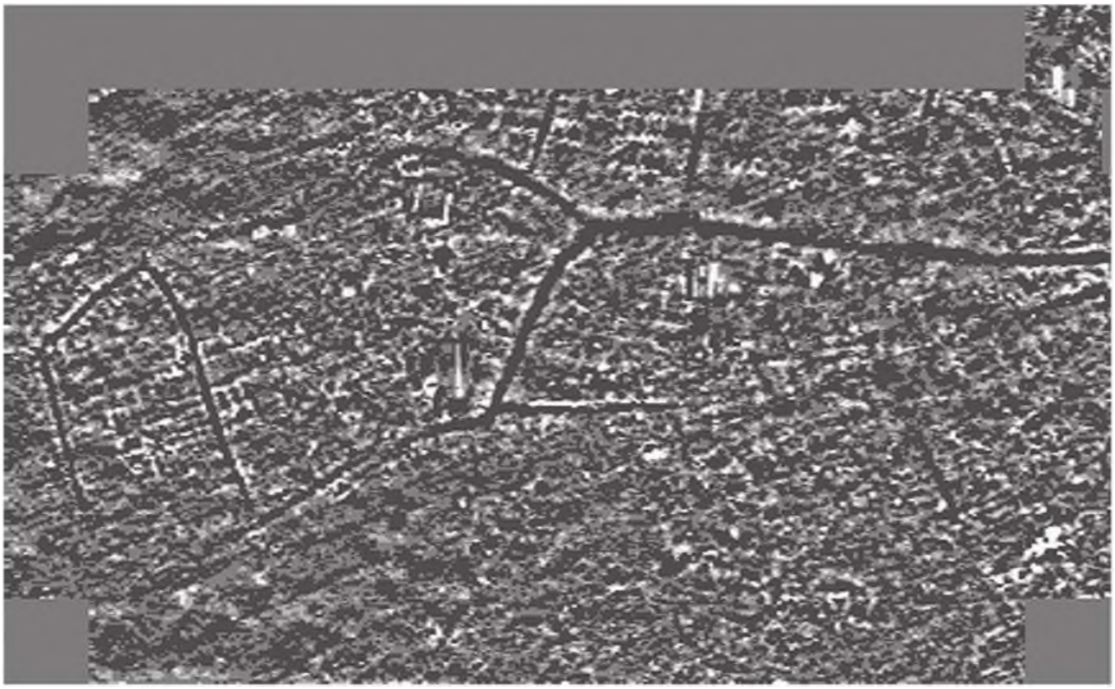

Fig. 4. A close-up of the areas in the Lower Town where magnetic field gradient surveys were conducted.

ering about 16.5 ha (Algaze et al. 1995: 22–23, 25–26) (figs. 2 and 4). Preliminary examination of the magnetometry data demonstrated that the reconstructed images corresponded to the latest phases of occupation around 2100 B.C.E. (Algaze et al. 1995: 22). Visualized representations of the magnetometry survey results brought to light plans of architectural structures and lines of streets in a crowded environment within the habitation quarters.

Analysis of the Excavation Data

To reconstruct household activities and the use of space across the excavated houses, I carried out a systematic analysis of the quantitative distribution of the domestic material remains, including built-in features, small finds, lithic debitage, animal bones, and ceramic sherds obtained from the floor levels within the 13 non-elite houses (fig. 3). Rather than examining the distribution of household material culture on a house-by-house basis, I systematically examined the distribution patterns across houses and neighborhoods. To conduct the systematic examination, I presupposed the following set of room functions; (1) entrance rooms, (2) reception rooms, (3) living rooms, (4) workshops, (5) food preparation and processing rooms, (6) kitchens, (7) storage rooms, (8) pantries, and (9) mortuary rooms. I established these room function categories based mainly on ethnoarchaeological accounts of domestic space use in Iranian and Syrian villages by Watson (1979) and Kramer (1982), Sweet (1960), Horne (1994), and Kamp (1982). I used these analogical accounts in a modified way, since Titriş was a walled, urban settlement, whereas these ethnoarchaeological observations were made at small agrarian villages. For example, I did

Table 1. Criteria for assigning rooms to functional categories.

(1) Entrance Rooms	Direct access from street
(2) Reception Rooms	Next to entrance rooms. Otherwise similar to Living Rooms (below).
(3) Living Rooms	Large floor area; presence of door sockets indicating privacy and security; plastered floors; provision for light and warmth; located relatively deep within the house.
(4) Workshops	Presence of 5 or more stone or metal tools; 2 or more weaving, spinning and sewing tools; large floor area; evidence for retouching, flint-knapping, and butchering activities.
(5) Food Preparation and Processing Rooms	Presence of two or more utensils for food preparation; high density of meat-bearing bones, non-meat-bearing bones, and bones with butchering and burning marks; large floor area; provision for water storage.
(6) Kitchens	As food preparation rooms, but with the necessary addition of a fire installation.
(7) Long-term Storage Rooms	Small floor area, deep within the house; presence of door sockets; mud floors.
(8) Pantries/Short-term Storage Rooms	As above, plus the presence of five or more complete ceramic pots.
(9) Mortuary Rooms	Presence of cist-tomb.

not set up a room-function category for stables or animal pens for the Titriş houses. Even though the researchers commonly found animal quarters in the houses at these Near Eastern villages, sufficient archaeological evidence that the house occupants kept domesticated animals in their houses is lacking at the Titriş houses in the urban residential neighborhoods.

Since none of these room-functions are mutually exclusive, some rooms may have had multiple room-functions simultaneously. Alternatively, perhaps the functions of these rooms changed at different seasons or in the course of years and generations. I assigned most of the rooms to one or more of these categories based on the criteria in Table 1.

First, I looked at architectural and spatial factors, including room size, ventilation, availability of light, and accessibility to each room, all of which influenced how the occupants used different rooms. Room size is an important indicator of the general function of each room. Larger rooms may have permitted multiple activities to be conducted simultaneously, and smaller rooms may have been suitable for long-term storage. Within the 13 structures in the non-elite residential quarters, I identified 127 rooms containing material remains at floor levels (primary context). I could confidently determine most of the room areas, and I divided these rooms into three levels according to their sizes: (1) large rooms: 10.4 m^2–48 m^2 (41 rooms), (2) medium rooms: 5.72 m^2–10.22 m^2 (42 rooms), and (3) small rooms: 0.4 m^2–5.6 m^2 (44 rooms). The boundaries between these groups are essentially arbitrary. The aim was to construct three groups containing roughly equal numbers of rooms. The slightly

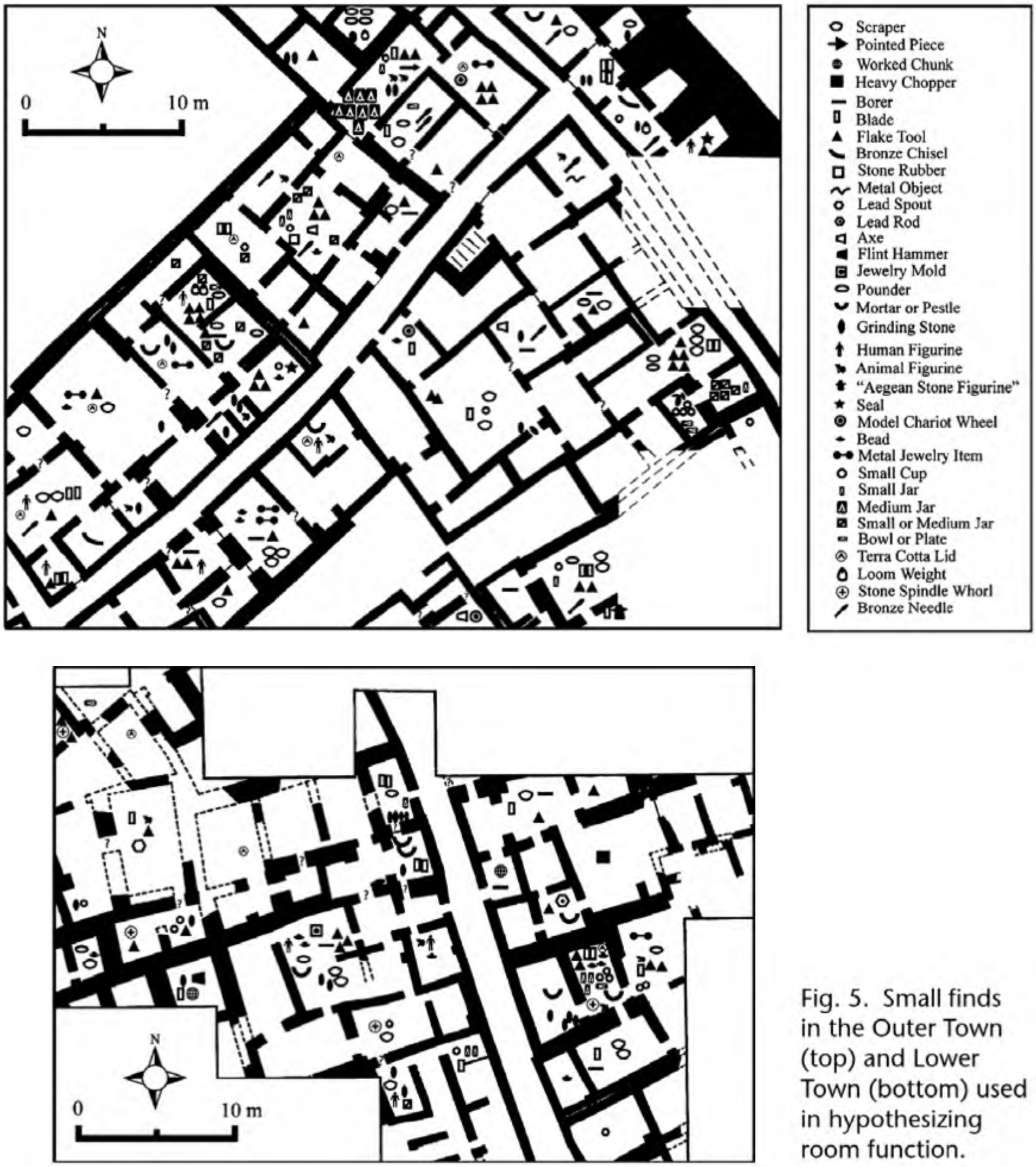

Fig. 5. Small finds in the Outer Town (top) and Lower Town (bottom) used in hypothesizing room function.

larger number of small rooms (44) is due to a cluster of rooms of equal size on the boundary with the group of medium-sized rooms.

The degree of room accessibility—defined as the number of doorways to be passed to reach each room from an entrance—tends to be related to the role that the room played within the house (Hillier and Hanson 1984: 14–15). The more doorways and rooms one has to pass, the more private and hidden the room becomes. I expected private sectors within the house—living rooms, kitchens, and storage areas—to be located toward the deep parts within the house.

Second, I quantitatively and visually represented and analyzed the distributions of built-in features (fire installations, intramural tombs, floor types, door sockets)

Table 2. Functional categories of small finds.

(1) Stone and metal tools	Total 157: flake tools (N = 55), blades (N = 32), scrapers (N = 27), borers (N = 11), stone pounders (N = 17), other stone tools (N = 9), metal tools (N = 5), jewelry mold (N = 1). Assumed to indicate craft workshops.
(2) Utensils for food preparation	Total 49: grinding stones (N= 39), mortars or pestles (N= 10). Assumed to indicate locations where food was prepared before cooking.
(3) Personal items and ornaments	Total 46: seals (N=2), model chariot wheels (N=3), body ornaments (N=20), figurines (N=21). Assumed to indicate locations where the possessors of these items often frequented or spent a significant amount of time each day.
(4) Domestic ceramic containers and terracotta lids	Total 62: small conical cups (N=22), small jars (N=11), medium jars (N=8), small or medium jars (N=15), bowls/dishes (N=6). Assumed to indicate locations for pantries or short-term storage.
(5) Weaving, spinning, and sewing tools	Total 19: stone loom weights (N= 4), spindle whorls (N= 4), bronze needles (N = 11). Assumed to indicate locations of weaving, spinning, and sewing activities.

and macro-level artifacts (stone and metal tools, ceramic containers, metal ornaments, personal items) (figs. 3 and 5). I plotted on the map the locations of 31 fire installations and 7 intramural cist-tombs. I took the presence of a fire installation to indicate the likely use of the room as a kitchen or living room, and I defined rooms equipped with a cist-tomb to be mortuary rooms.

I distinguished different types of floors in the 127 rooms. Floors tended to be one of the following three types: (1) lime-plastered, (2) cobbled, or (3) compacted mud. Different floor-types appeared to indicate different use of the space. For example, the house occupants may have carefully plastered floors in the living and reception rooms but they may well have left floors in storage rooms with an earthen surface. Cobbled floors were probably for draining rainwater or wastewater. This suggests that rooms with cobbled floors were possibly unroofed, and that activities that produced wastewater took place on the cobbled surfaces.

The excavations uncovered at least 27 door-sockets at doorways between rooms within the houses, as well as at the entrances from the street. Having a door at the entrance to rooms and houses must have been useful not only for maintaining warmth in a cold climate but also for privacy and security purposes. Therefore, entrance, reception, storage, and living rooms were likely to be equipped with doors.

As for portable artifacts, the excavators found a total of 359 small finds in primary contexts within the residential structures. To examine their distribution within the houses, I also plotted their types and numbers on maps of the building structures. I grouped these 359 small finds into five functional categories as summarized in Table 2.

Third, I investigated distributions of smaller artifacts and waste—flint-knapping debitage and animal remains. When hypothesizing room function based on these

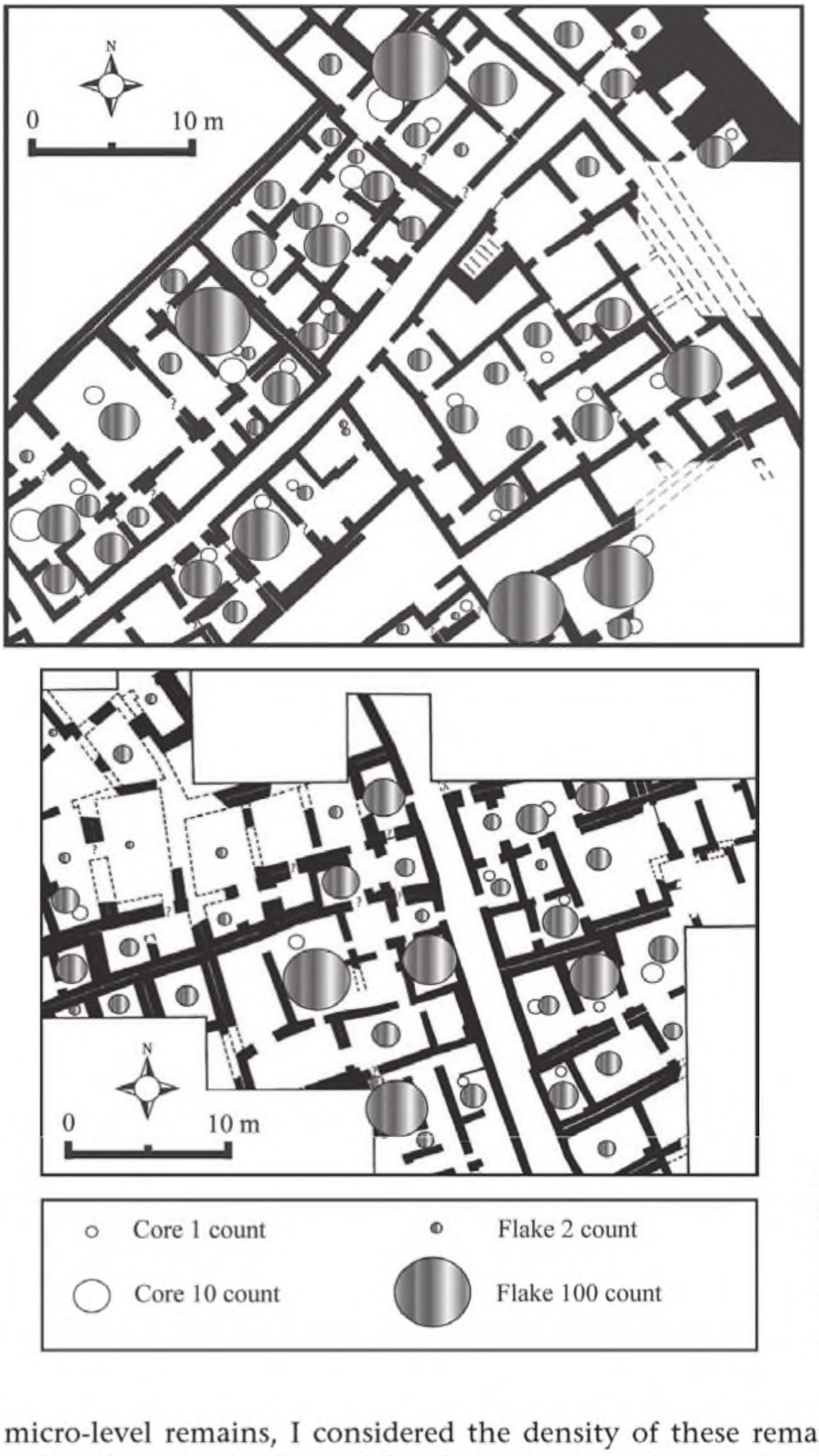

Fig. 6. Quantitative distribution of flint-knapping debitage in the Outer Town (top) and Lower Town (bottom).

micro-level remains, I considered the density of these remains per square meter, rather than the total count for the room, in order to rule out the possibility that large debitage or waste counts may have been only a reflection of the large areas of the rooms in which they typically occurred (fig. 6). I adopted the same procedure for ceramic sherds as well (discussed later).

The lithic debitage consisted of 1,601 flakes and 83 cores. Traces of flakes and cores indicate locations for flint-knapping and for workshops where the household

Table 3. Sherd counts and weights.

Functional type	*Sherd count*	*Total weight (kg)*
Cooking pots	5,465	185.21
Storage jars	3,051	499.25
Cups	2,050	630.405
Serving bowls	573	
Food-preparation vessels	177	
Short-term containers	1,008	

members produced stone tools. Since I did not see any notable clusters of rooms with high core- or flake-densities, I arbitrarily took into consideration the 12 rooms with the highest density of these artifacts and hypothesized that these 12 rooms were locations for flint-knapping activity.

To quantify the remains of domesticated animals, I used the number of identified specimens (NISP) in this study. The excavations uncovered a total of 584 sheep and goat bones (*Ovis aries*, *Capra hircus*, or *Ovis/Capra*) and a total of 226 cattle bones (*Bos taurus*) among the floor contexts of the houses. These large quantities of bones of cattle, sheep, and goat—the primary animals for food—probably represent leftovers from culinary activities within the non-elite houses. Burning and butchering traces were also commonly seen on bones of all of these high-frequency animal taxa from the Titriş houses. I considered bones bearing butchering or burning marks to indicate possible locations for butchering and cooking activities.

I divided the sheep, goat, and cattle bones into three categories based on the amount of usable meat on each bone, in order to examine the quantitative distribution of different elements of these animals. I used Binford's modified general utility index (MGUI) for sheep (Binford 1978: 74) to divide the sheep, goat, and the cattle bones into three groups: (1) primary meat-bearing bones, (2) secondary meat-bearing bones, and (3) non-meat-bearing bones. To include the animal bone data in the process of establishing hypotheses about room function, I considered the 12 rooms with the highest concentrations of primary and secondary meat-bearing bones per square meter for sheep/goats and for cattle as possible locations for cooking and food consumption. Also, I identified the 12 rooms with the highest concentrations of non-meat-bearing bones from both sheep/goat and cattle as possible locations for butchering and food processing activities.

Sherd Distribution and Room Function

A last category of evidence is the large quantity of ceramic sherds, from functionally distinguished pottery types including storage jars, cooking pots, drinking cups, serving bowls, food preparation vessels, and short-term containers, collected from the floors of the 13 houses. The counts and weights for sherds of each functional type are shown in Table 3.

I used the quantity (or absence) of these six functionally diagnostic pottery types as an independent line of evidence to test the validity of the general room func-

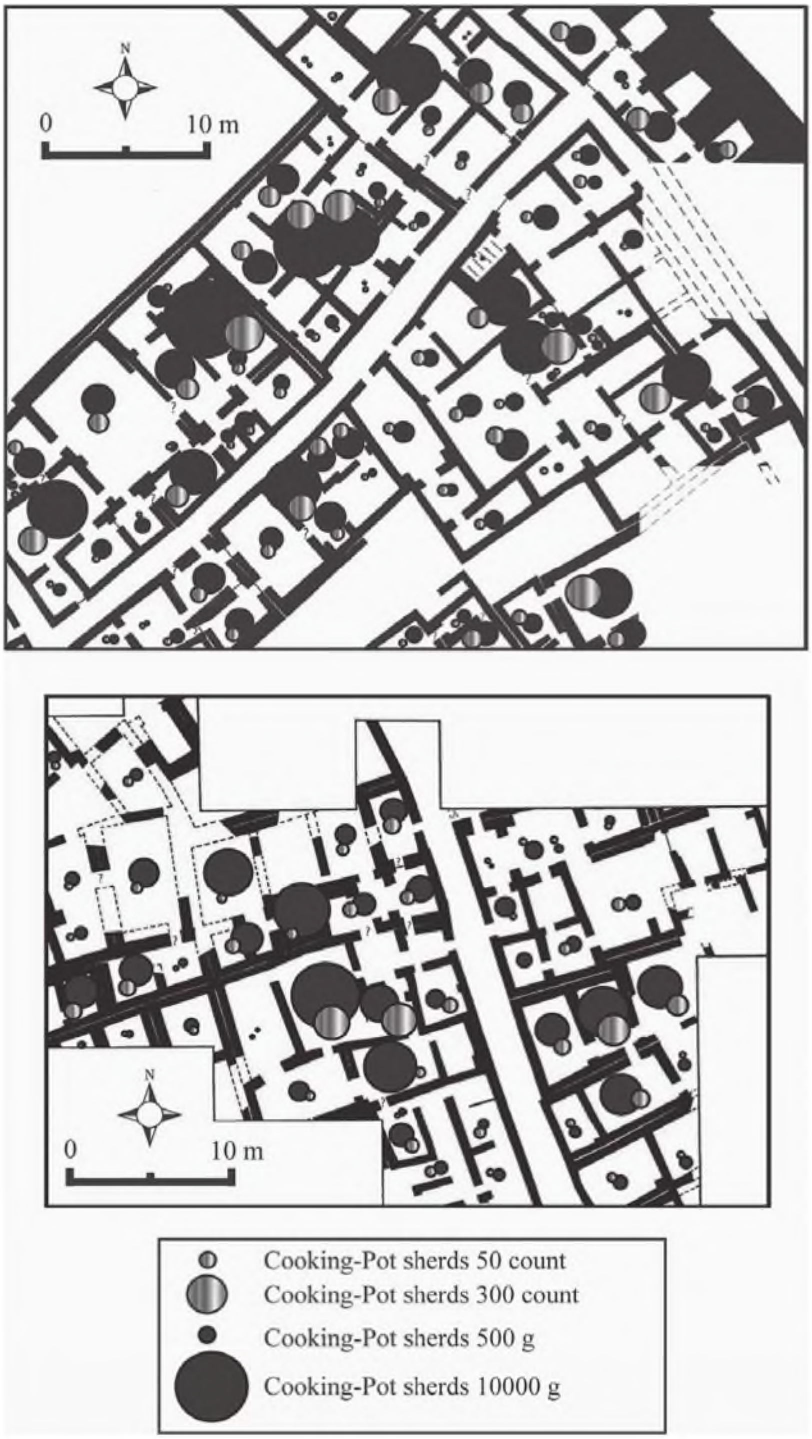
N
0
10 m
N
0
10 m
Cooking-Pot sherds 50 count
Cooking-Pot sherds 300 count
Cooking-Pot sherds 500 g
Cooking-Pot sherds 10000 g

Fig. 7. Quantitative distribution of cooking-pot sherds.

tions that I had hypothesized through the various lines of evidence described above. To confirm or negate the hypotheses about the general functions of the individual rooms, I took into account the 12 rooms containing the highest concentrations of each of these six functionally diagnostic pottery types. The quantitative distributions of the six pottery types did not, however, assess the validity of the hypotheses about some of the room types, since the functions of some of these pottery types are too general to specify domestic activities that might have been associated with them. The visualization of the quantitative distribution of these pottery sherds both by count, and whenever available by weight, facilitated the recognition of their distributive patterns across the 13 dwellings (fig. 7).

Hypothesized Room Functions

Based on the distributions of the above-mentioned household material remains (except pottery sherds), I associated rooms with the functional categories in Table 1 (fig. 8). I found most of the room types more-or-less evenly represented in these houses, particularly the houses that were completely excavated. This indicates that there was a significant consistency in the types of household activities and the use of domestic space across these non-elite private houses.

Entrance Rooms

Entrance rooms connected the sheltered space of the household interior to the street outside. I defined, rather than hypothesized, the entrance-room category by the presence of an entrance from the street. I recognized a total of 14 entrance rooms in 7 dwellings.

The house occupants seem to have used a number of these entrance rooms more than simply as points of access from the street, since material remains of domestic chores, though modest in quantity, were also present in some of these rooms. I found non-meat-bearing bones, flint-knapping debitage, and fire installations, and facilities, including a water basin, were also present in these entrance rooms. The household members may thus have used some of the entrance rooms exclusively for themselves as extra space to carry out domestic tasks, while others were to receive guests. A functional contrast between private and public thresholds would explain the presence of multiple entrances in many houses.

Even though I found the material remains of domestic chores in the entrance rooms in modest quantities, I expected that certain ceramic sherds, such as those of cooking pots, serving bowls, food preparation vessels, and storage jars, should not occur in large quantities in these rooms. As was expected, 11 out of the total 14 entrance rooms did not contain high concentrations of any of these sherd types, corroborating the idea that domestic activities took place—but not extensively—in these rooms.

Reception Rooms and Living Rooms

According to the definition adopted here, the house occupants used reception rooms primarily to receive and entertain guests, whereas living rooms were exclusively for the household members to spend time in relaxation and entertainment. It was difficult to identify and differentiate between these two types of rooms through the material remains. I expected these rooms to be largely void of archaeological remains, due possibly to intensive maintenance and frequent cleaning of such important rooms within the house.

I hypothesized 23 rooms to be reception rooms and/or living rooms, largely on the basis of architectural factors and features. Whereas many of the houses had more

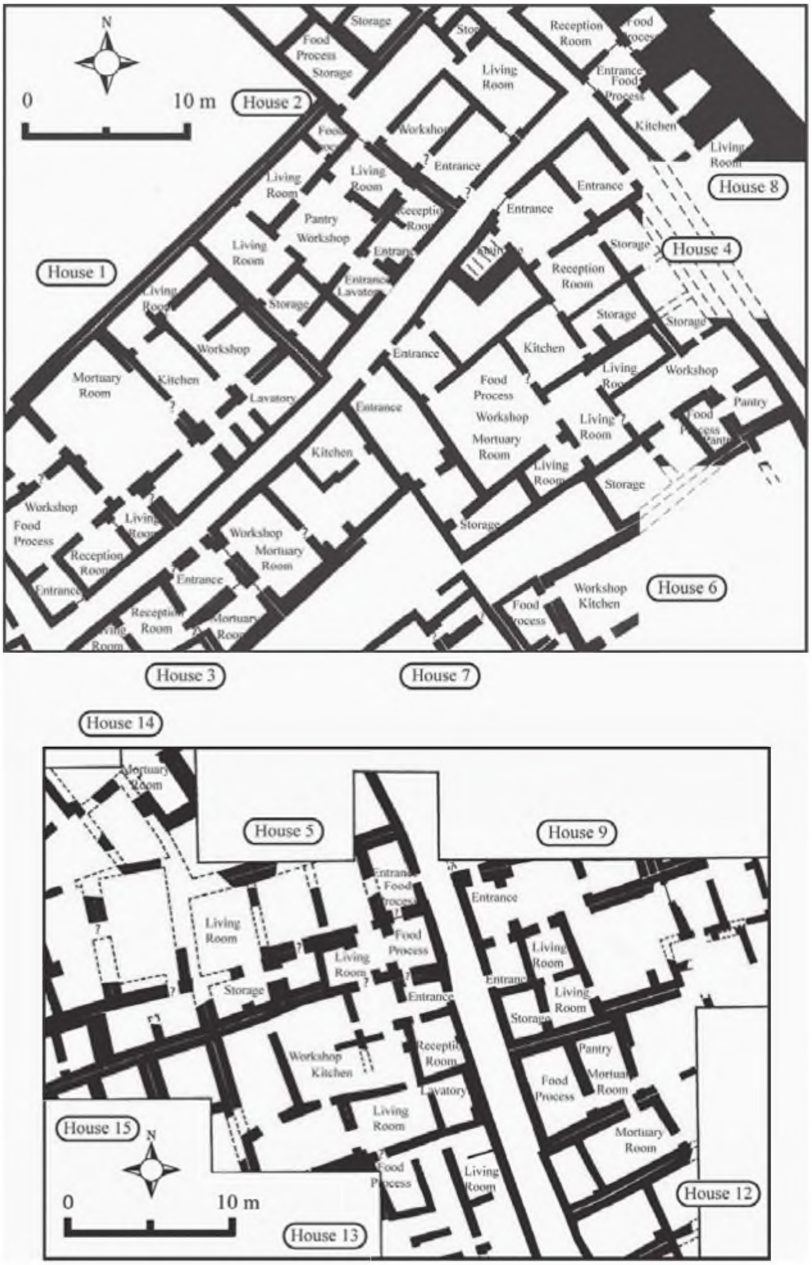

Fig. 8. Room functions in the Outer Town (top) and Lower Town (bottom).

than one living room, a single reception room existed in six of the houses. If all of these rooms were used contemporaneously, most houses would have had more than one living room. The explanation for the presence of multiple living rooms could be that extended families occupied some of the houses. Alternatively, there may have existed various types of private rooms, each with a different function.

I postulated that sherds from cooking pots, storage jars, and food preparation vessels would not be found in large quantities in living rooms or reception rooms. Because of the usefulness of cups, serving bowls, and containers in living and reception rooms, I expected that these pottery types were present. As expected, 21 of the

23 rooms hypothesized as reception rooms or living rooms lacked dense clusters of sherds from cooking pots, storage jars, and food-preparation vessels.

Workshops

When five or more stone or metal tools, or two or more tools used in cloth production, were present in sizable rooms or courtyards, I hypothesized these rooms to have been workshops. A total of nine workshops were hypothesized in six houses. All of the houses with the central-courtyard house plan—Houses 2, 4, and 5—had their workshops in the central courtyard. Except in House 1, these workshops occupied the largest rooms in the houses.

Most of the rooms hypothesized as workshops were multifunctional rooms containing considerable remains of other domestic activities, especially cooking and food processing/preparation, flint-knapping, and butchering. For this reason, different distributive patterns of ceramic sherds occurred among the eight rooms hypothesized as workshops and so did not support these hypotheses. Various craft activities conducted at the household level, such as the production of textiles and flint tools, were limited and unspecialized.

Food Preparation/Processing Rooms and Kitchens

To separate kitchens from food preparation/processing rooms, I considered kitchens to be rooms in which the occupants regularly placed food over a fire. Prior processing of food (butchering, washing, grinding, etc.) may have taken place in separate functionally specialized rooms. I did not found any clear archaeological distinction, other than the presence or absence of a fire installation, between food processing/preparation rooms and kitchens within the 13 houses.

I hypothesized a room to be a food processing/preparation room or kitchen whenever I found two or more utensils for food preparation or when I observed a high density of meat-bearing bones, non-meat-bearing bones, or bones with butchering and burning marks. Architectural factors, including sufficient space, availability of light and ventilation, and access to water, also supported the identification of these rooms. A total of 22 rooms and courtyards were so identified, six of which I considered to be kitchens based simply on the presence of a fire installation. Most of the Titriş houses had at least one food-processing/preparation room and a kitchen.

I expected to find sherds from cooking pots in large quantities in kitchens, while sherds from food-preparation vessels to be abundant in food-processing/preparation rooms. Of the six locations hypothesized as kitchens, the testing confirmed four by the presence of high concentrations of cooking pot-sherds in these rooms. The results were inconclusive for the remaining two kitchens since I did not find any particular sherd clusters in these rooms.

As for the 16 hypothesized food processing/preparation rooms, the testing confirmed the identification of only two rooms through the presence of large numbers of sherds from food preparation vessels. The sherd data from three of the remaining rooms pointed strongly to the possibility that they were kitchens, rather than food processing/preparation rooms. The other 11 rooms lacked any diagnostic sherd clusters or showed only a moderate presence of food preparation vessels.

Pantries and Long-Term Storage Rooms

I hypothesized the possible locations for long-term storage rooms, where the household members stored liquids and grains in bulk in pithos-sized storage jars, on the basis primarily of architectural and feature elements, including relatively small floor sizes, locations deep within the houses (back rooms, with little human traffic), the presence of door sockets, and mud floors. Pantries, on the other hand, were short-term storage rooms where the house occupants temporarily kept domestic commodities, especially kitchen utensils. I hypothesized rooms to be pantries when they contained five or more complete ceramic pots found intact. I postulated a total of 13 long-term storage rooms and 6 pantries.

I expected that the 13 rooms hypothesized as long-term storage rooms would contain large amounts of sherds from pithos-size storage jars. The testing confirmed the identification of two storage rooms by the high concentrations of storage jars in them. Two additional rooms contained large amounts of cooking-pot sherds rather than the expected storage-jar sherds. The remaining 9 storage rooms produced only moderate amounts of storage-jar sherds, and support for the hypothesized function of these rooms was thus inconclusive.

I expected pantries to contain sherds from cups, serving bowls, and possibly small-to-medium-sized containers. It was not a straightforward task to test the locations of short-term storage rooms or pantries using the ceramic-sherd data, since it was often unclear whether we found these containers in places where the occupants used them or temporarily stored them. The testing confirmed two out of six rooms through the high concentrations of sherds from containers, cups, and serving bowls. In one proposed pantry, a cluster of cooking-pot sherds pointed to a different culinary role for the room. The sherd data provided inconclusive support for the three remaining hypothesized pantries.

Mortuary Rooms

As with the entrance rooms, I defined the category of mortuary rooms rather than hypothesized their existence. I defined seven rooms or courtyards, distributed across five houses (Houses 1, 3, 4, 12, and 14), as mortuary rooms due to the presence of a cist-tomb. A number of pot burials were found in the 13 houses, but I considered only the locations for the cist-tombs as definitive, since the house occupants created most of these built-in tombs when they constructed the houses around 2300 B.C.E., indicating the intended function of the rooms. In addition to the presence of a cist-tomb, there was no archaeological evidence that any ritual activities regularly took place in these rooms.[1]

It seems that, even though these rooms were some of the largest spaces in the houses, mortuary rooms were not primary locations for domestic activities. Mortuary rooms were either courtyards or one of the largest rooms of the houses, and the cist-tombs were located in the corner of these spaces. Although this availability of space suggests that the household members conducted other domestic activities adjacent to the cist-tomb locations, there was a general scarcity of traces of domestic activities in the mortuary rooms. In other words, despite the large room sizes, most of

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1. Laneri (2002: 36), however, postulates that mortuary rituals were indeed carried out inside the cist-tombs.

the mortuary rooms were found largely devoid of the household remains associated with daily domestic chores. Five out of seven mortuary rooms produced no concentrations of ceramic sherds in them, corroborating the idea that the house-dwellers performed few domestic activities in the mortuary rooms. Another significant find is that two remaining mortuary rooms contained many storage-jar sherds, suggesting that mortuary rooms, frequently located in the largest rooms of the houses, may have served as storage spaces as well.

Remaining Unassigned Rooms

The excavators reported Room 7 in House 4, a small room containing steps, as a stairway. It is unknown whether this staircase led to the second floor or onto the roof, and there was no space for the house-dwellers to carry out any activities in this narrow space.

Three rooms may have been lavatories. One of these rooms had a circular stone feature connected to a drain that led out to the street. Two others were each equipped with a stone basin with a spout that drained to the street.

Additionally, there were a number of rooms for which I could not establish hypotheses about function. It was particularly difficult to build hypotheses for Houses 8, 12, 13, 14, and 15, due primarily to the incompletely understood architectural contexts for these partially excavated houses as well as to the poor preservation of the material remains at the floor levels of these dwellings.

Discussion

This analysis of domestic activities and use of space brought to light a number of interesting patterns observed across the excavated houses and neighborhoods. These patterns represent shared ideas about what constituted a house in the third-millennium urban residential neighborhoods at Titriş. In these domestic structures, there were chains of small rooms along the city streets that often served as entrance rooms and storage space. The entrance rooms almost always led to a reception room or courtyard. The houses encompassed one or two large centrally-located courtyards, which the house occupants frequently used as multipurpose workshops. A number of houses had more than one kitchen and living room, indicating the presence of more than a single nuclear family. These houses also possessed a number of storage rooms, some of which were semipermanent and some others temporary, typically located in the backrooms and in the chains of small rooms along the street. These houses in general provided ample space for their occupants to conduct domestic activities within them. This is especially evident from the large sizes of some of the entrance rooms and in the limited use of large mortuary rooms for domestic activities.

Four categories of ceramics, excluding food-preparation vessels, tended to co-occur with one another and with high densities of lithic debitage and non-meat-bearing sheep/goat bones. In contrast, not only were food-preparation vessels isolated from the clusters of other pottery types but they also showed a strong correlation with utensils for food preparation (grinding stones, mortars, and pestles), as well as with stone and metal tools.

Based on the results of the distributive analyses of the household assemblages, I argue that large rooms can be divided into three functionally distinct types in the

Titriş houses. The first served as workshops where the household members conducted multiple activities side by side, including weaving, spinning, sewing, and other crafts. Food that was processed in these food-preparation rooms was probably for long-term use, such as ground grains, dried meats, pressed oils, and pickled vegetables. The second type was kitchens, where the house occupants placed foods over a fire to cook them. Eating may have taken place in the kitchens as well, while kitchens may have also served as the daily storage space for cups, bowls, and plates. These workshops and kitchens were, like the living rooms, locations where the occupants probably spent much time during the day and probably all year round. The third category of large room functioned as mortuary rooms, which generally showed only a restricted presence of remains from domestic activities. Thus, there often seem to have been conflicting demands regarding the use of the centrally-located courtyard. The house-dwellers extensively used some of the courtyards for everyday activities, while they left others relatively quiet, as a sacred space containing the family crypt.

On the whole, this study of domestic activities in the non-elite houses at Titriş revealed that the organization and use of space was consistent across houses. These consistent patterns were repeated in each of the two widely separated excavated areas. Despite some variation in the size and form of the houses, the house occupants performed very similar domestic activities in all of the dwelling structures, producing the same kinds and amounts of material remains.

This consistency of patterning in spatial organization and domestic activities further indicates homogeneity in economic status within these residential sectors. That is to say, there were no clear qualitative differences in the household activities that point to differences in wealth distribution or social class among the 13 houses. The uniformity, in both quality and quantity, of the funerary offerings that the occupants placed in their family crypts corroborates the idea that these households were of similar economic status. The paleopathological studies of the skeletal remains recovered from the intramural tombs also revealed little difference in nutritional conditions among these households, strongly supporting the idea that there was close similarity in economic status in the residential areas at Titriş (Hon̨ça and Algaze 1998: 117). Hald (2010) also observed notable uniformity in distribution patterns of the archaeobotanical remains across the residential houses and neighborhoods.

In addition to culinary activities, these ordinary city inhabitants spent some time making and reshaping their domestic stone tools. They also spun and wove textiles, butchered livestock, processed animal hides, and received guests on a regular basis. The absence of evidence for specialized craft activities, as well as the minimal presence of seals and sealings, further testifies that these household members were most likely small-scale farmers and that commercial and administrative affairs played almost no role in these residential areas.

Analysis of the Magnetometry Data

To illuminate the general life of the non-elite urban population at Titriş as a whole, it was essential to examine how typical the house conglomerates from the excavated areas were of the extensive residential quarters more generally. The analysis of the magnetometry surveys brought to light architectural plans and street systems

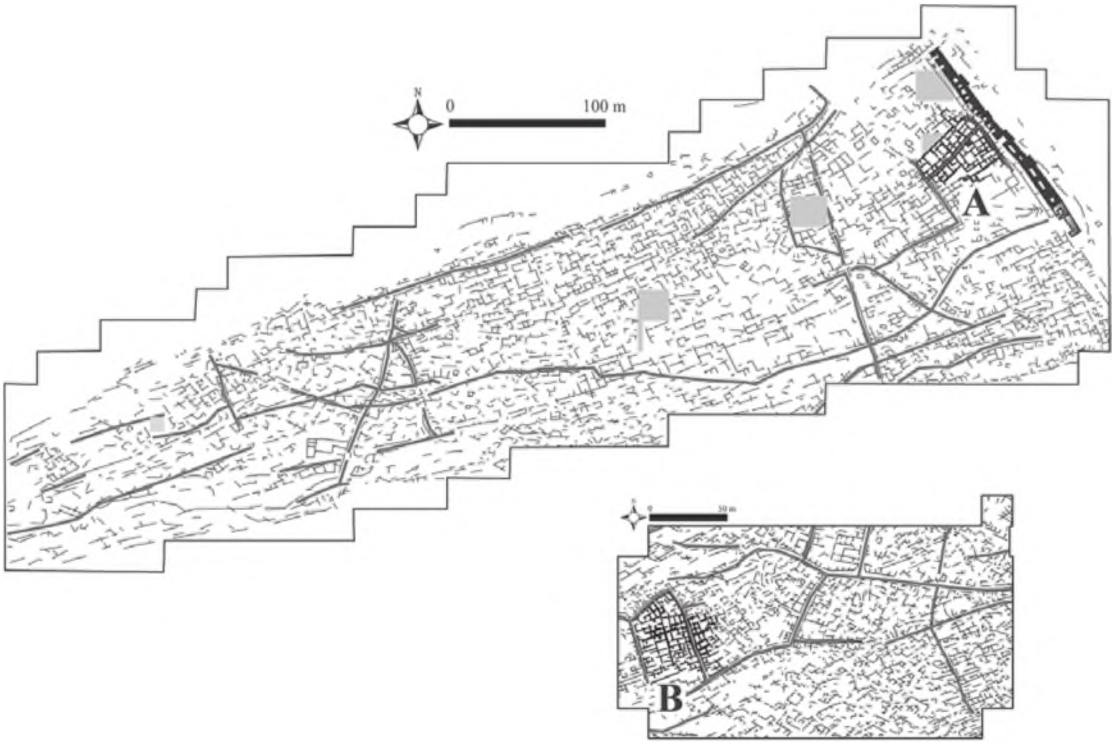

Fig. 9. Reconstructed wall foundations and streets in the Outer Town (top) and Lower Town (bottom). The two horizontally excavated areas (A and B) are shown in darker shading.

over a large, unexcavated area (a total of 16.5 ha) and provided me with an extremely valuable and unprecedented dataset from which to generalize about the layout of the largely non-elite residential quarters at Titriş (figs. 2, 9). By linking the excavation data and survey results, a number of important socioeconomic phenomena emerged that characterized the urban non-elite residents as a whole.

Using Geoplot and Adobe Illustrator, I processed and analyzed the magnetometry data, tracing maps of architecture and streets. Though there were differing degrees of visibility, house and street plans were clearly visible in the magnetometry images across the extensively surveyed residential areas. When I superimposed the excavation data onto the magnetometry map, it perfectly reflected the architectural plans and streets derived from excavation in the magnetometry data. This high visibility of the subsurface architectural plans in the late-third-millennium residential neighborhoods was largely due to the fact that architectural structures lay close to the surface, undisturbed by later occupation layers.

As I traced the architectural and street plans in the magnetometry map, many recurring spatial and architectural patterns came into view throughout the lower city, probably reflecting the centrally-planned nature of the settlement construction at Titriş around 2300 B.C.E. Streets were long, straight, and continuously lined on both sides with walls that often extended throughout the neighborhood blocks. Oriented with respect to the nearby streets, rectangular or square structures filled up the occupied areas. Vacant land units were rare throughout the residential quarters. Inside the walls of these structures were chains of rectangular or square rooms of small-to-medium size, usually with walls parallel or perpendicular to the direction of the nearby streets. Since these architectural structures shared walls between them, it was difficult to distinguish with confidence where one house ended and another began. Nevertheless, it seems that the majority of the houses in the lower city followed relatively standard house plans and sizes, based on the observation of a number of architectural plans that were most clearly preserved in the magnetometry map.

This discussion shows that the various spatial and architectural patterns understood from the excavated areas were consistently seen in the house plans and street systems reconstructed from the magnetometry data in both the Lower and Outer Towns. In other words, the two extensively excavated areas at opposite ends of the city contained houses that were representative in size and floor plan of the much larger, mostly homogeneous neighborhoods of which they were a part. The majority of the structures visible on the magnetometry map are likely therefore to have been similar in nature to the excavated houses and were in all probability domestic houses of non-elite city inhabitants. Even though I identified a few areas with possible public buildings in the Outer Town, there were no definite traces of exceptionally large structures, reinforcing the observation that domestic buildings were pervasive in this late-third-millennium urban settlement. By extension, I conclude that the domestic activities that the house occupants commonly carried out within the excavated houses should be considered representative of the majority of the houses in the residential quarters at Titriş.

Spatial Organization and Economic Hierarchy in the Urban Residential Neighborhoods

The striking consistency in the daily activities and use of domestic space throughout the extensive habitation areas at Titriş leads to the understanding of urban spatial organization and economic hierarchy in this urban settlement. At Tell Asmar and Tell Khafajah, two other late-third-millennium urban centers in central Mesopotamia, Henrickson investigated wealth differences and distributions within the excavated portions of these two sites and concluded that wealthy and less-wealthy households were segregated (Henrickson 1981: 78). Henrickson's conclusion is in contrast to the findings of Brusasco at Ur (1999–2000, 2004) and Stone at Nippur (1987). Brusasco (1999–2000: 144) argues that social class was not the primary factor underlying neighborhood organization at Ur in the early second millennium B.C.E. Similarly, Stone (1987: 126) concludes that the residential areas at the early-second-millennium urban settlement of Nippur were largely integrated, because houses that showed considerable differences in wealth existed contiguously within the same habitation area. Stone and Zimansky (2004) examine the socioeconomic structure of the settlement at Maškan-šapir in southern Mesopotamia, based primarily on quantitative analyses of the distribution of features and artifacts visible on the surface of this early-second-millennium city. They conclude that residential neighborhoods were associated with occupation rather than social class or wealth and that inhabitants of varying social class resided within the same neighborhoods.

At Titriş, I contend that this late-third-millennium settlement was largely segregated, as Henrickson found for Asmar and Khafajah. The uniformity in the nature and amount of household material remains observed in the excavated areas at Titriş strongly points to homogeneity of economic status among the occupants of these households. In other words, house occupants performed very similar domestic activities in all of the excavated dwelling structures, producing the same kinds and amounts of material remains. I believe that the consistent patterns in the domestic activities, repeated at two separate excavated sectors of the site, attest to cultural conventions prevalent across much of the non-elite residential portion of this site.

These contrasting conclusions drawn by different researchers regarding economic homogeneity or heterogeneity in residential neighborhoods of early Mesopotamian cities may be attributed to differences in the way in which the researchers measured wealth and social class at the respective sites. It is possible, though less likely, that late-third-millennium cities were more segregated than early-second-millennium settlements, regardless of their geographical locations.

Conclusions

In recent years, researchers have increasingly investigated both elite and non-elite residential quarters of ancient settlements in archaeological inquiries as they view and study societies in their entirety. This new development has been stimulated by the growing use at archaeological sites of geophysical surveys (employing magnetometry, electrical resistivity, and ground-penetrating radar techniques), as well as more instances of extensive archaeological investigations in residential neighborhoods. In this positive trend toward the holistic view of ancient settlements, household archaeology has a vital role to play in illuminating functional, socioeconomic, and symbolic aspects of the daily lives of the population as a whole.

Understanding the daily lives of the majority of a population must ideally begin with a systematic investigation of domestic architecture and/or household floor assemblages, encompassing as many houses and residential neighborhoods as possible. Substantial architecture may not have been preserved subsequently, but it is nevertheless crucial to excavate at least a few houses completely in order to understand the approximate size and nature of the basic analytical unit. An adequate study of habitation areas also requires the incorporation of rich and diverse household remains from houses, including architectural features, small finds, pottery sherds, lithic debitage, and plant and animal remains. To elucidate the daily domestic activities of the bulk of population at a specific time, extensive horizontal excavation is highly desirable for the investigation of synchronic activity areas or room functions across domestic architecture.

A vital additional step in household archaeology is to establish whether or not the excavated houses and residential quarters are typical of the rest of the residential neighborhoods at the specific settlement. When dealing with an urban settlement, in particular, it is crucial to enlarge the sample size to comprehend with confidence the settlement structure as a whole. But we should not impose the excavated results upon the rest of an extensive settlement without establishing that the excavated portion of the site is representative of the remainder. To allow the researcher at least to trace the architectural and street configuration, it is best to conduct a surface/subsurface survey over a large proportion of the settlement area. Survey techniques of this sort may include a magnetic field gradient survey or surface scraping.

The site of Titriş represents an unprecedented and ideal case-study in the nature of domestic activities for the bulk of an urban population. The two extensively excavated areas contained houses that were representative, in size and floor plan, of the much larger, mostly homogeneous neighborhoods. I reconstructed household activities and the use of domestic space at this site through systematic investigations of the multiple excavated houses and by adopting methods for projecting the results of those investigations onto broader unexcavated residential areas of the site. I reconstructed the daily activities of the non-elite population not from written documents, which often focus on particular aspects of the life of a select few, but from large amounts of household remains that these non-elite city inhabitants left in their houses. As the picture of their daily activities emerged at the household level, it became possible for me to examine additional socioeconomic issues, such as urban layout and economic hierarchy, at the settlement level.

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Households and Neighborhoods of the Indus Tradition: An Overview

Jonathan Mark Kenoyer

Introduction

The Indus Tradition is a term that encompasses a wide range of cultural developments that were taking place in the area of the greater Indus Valley of what is now Pakistan and western India. Beginning around 7000 B.C.E., we see evidence for early settled agro-pastoral communities at sites such as Mehrgarh in Baluchistan, Pakistan (fig. 1; J.-F. Jarrige and Meadow 1980; Kenoyer 2002a). By around 4000 B.C.E., regional cultures, with scattered villages and towns, can be identified throughout the vast alluvial plains and adjacent highland regions. The diversity of habitation structures includes rectangular mud-brick houses, huts made with posts and mud-plastered reed walls, and even semisubterranean pit-houses (Kenoyer 2002b). The distribution of these features suggests that a variety of different social and cultural patterns were adopted by communities living in different regions of the northwestern subcontinent. Around 2800 B.C.E., during the Early Harappan or Kot Dijian Period, the earliest incipient urban centers emerged in the northern Indus-Saraswati region. A study of settlement plans and other artifact assemblages indicates that many of the key elements of later Harappan urbanism are first seen in these Early Harappan towns and settlements.

Eventually, Harappan urban centers, which were considerably larger and more complex, emerged along the Indus and the Saraswati-Ghaggar-Hakra Rivers, as well as along the Gujarat coast (Kenoyer 2008). However, many of the basic features of site organization and structure derive from the Early Harappan Period. For more than 700 years, the Indus urban centers represent the integration of diverse communities in an equally diverse geographical and cultural landscape. The urban phase of the Indus Tradition is commonly referred to as the Indus Civilization or Harappa Culture. However, with the discovery of many sites along the now dry bed of the Saraswati-Ghaggar-Hakra River, some scholars refer to it as the Indus-Saraswati Civilization (Gupta 1996).

In this essay, I examine the nature of households and neighborhoods in the early periods of the Indus Tradition, tracing important continuities and changes in settlement layout and organization as well as in specific types of artifacts that may represent specific types of social, economic, or political units. While the term "household archaeology" has been common in the literature for some time, the range of topics that are subsumed beneath this heading can just as easily be included under other headings—for example, settlement studies, spatial analysis, and socioeconomic studies. The definition of a household or a neighborhood is relative and flexible and therefore difficult to define on the basis of archaeologically preserved remains (Kramer 1979; Kramer and Douglas 1992; Wilk and Rathje 1982). The terms "household" and "neighborhood" are not commonly applied to the archaeological record of the prehistoric and early historic periods in South Asia, but this does not mean that the issues relating to households are being ignored. In this chapter, I use these terms in a very general sense to refer to architectural and other types of features that delimit space that may have been used by single or extended family groups or simply a group of people living in or using a defined space (see also Foster 2009: 73). Since people living or working together are invariably engaged in multiple partially overlapping networks, a wide range of other artifacts can also be studied, particularly those related to specialized craft production, to understand changing patterns of social, economic, and political organization.

During the periods covered in this essay, the location of craft production was usually situated in association with habitation areas and as such is closely linked to household economic and subsistence activities (Graves 1991; Kenoyer and Miller 2007; Wilk and Netting 1984). Other artifacts, such as inscribed seals, possibly reflect specific individuals who are members of a household or groups of individuals organized as a household or a clan (multiple households). Through the critical analysis of these many different types of artifacts from major excavated sites, it is possible to identify regional patterns and also track major changes and continuities in household and neighborhood organization throughout the Indus Tradition.

Chronology

The Indus Tradition can be subdivided into five eras that represent major adaptive strategies including, but not limited to, subsistence and settlement (Table 1). In this essay, I focus on sites that relate to three eras, beginning with the Early Food-Producing Era. Each era can be subdivided into phases that are defined on the basis of a wide range of artifacts distributed in a region or locality and associated with a relatively distinct time period. Interaction systems provide essential linkages between phases and also between major traditions located in adjacent geographical regions (Kenoyer 1991, 2008; Shaffer 1992).

The Foraging Era represents a relatively long period of time and covers a diffuse geographical area during which mobile and semisedentary foraging and hunting communities began focusing on intensive exploitation of specific plants and animals. In specific areas of Afghanistan (Dupree 1972) and the edges of the Indus valley (Fairservis 1961), these adaptive strategies eventually led to the domestication of certain species. Sites from this era are found along the Baluchistan piedmont zone, in the Rohri hills, and adjacent deserts (Mallah 2008; Misra 1973), as well as throughout the coastal regions, from the Makran (Fairservis 1982; A. R. Khan 1968) to Gujarat (Ajithprasad 2002). Sites in the Indus Valley region that represent these transitional communities are defined by the presence of microlithic tools and other evidence of human occupation, such as accumulations of marine shell, grinding stones, and stone alignments. Since no horizontal excavations have been under-

Table 1. Indus Tradition: General Chronology

Foraging Era Mesolithic and Microlithic	10,000 to 2000 B.C.E.
Early Food-Producing Era Mehrgarh Phase	7000 to 5500 B.C.E.
Regionalization Era Early Harappan Phases Ravi, Hakra, Sheri Khan Tarakai, Balakot, Amri, Kot Diji, Sothi	5500 to 2600 B.C.E.
Integration Era Harappan Phase	2600 to 1900 B.C.E.
Localization Era Late Harappan Phases Punjab, Jhukar, Rangpur	1900 to 1300 B.C.E.

taken at the earliest sites, it is difficult to define settlement organization or the structure of habitation units. What is evident, however, is that these communities were mobile and relatively small. They also continued to exist alongside later village and even urban cultures (Possehl 2002), a pattern that has been well documented ethnographically in South Asia and other regions of the world.

The Early Food-Producing Era is represented primarily at the site of Mehrgarh (7000 to 5500 B.C.E.), which will be discussed in more detail later. At present, only one cultural phase (Mehrgarh Phase) has been identified for this era, but future excavations in other regions may result in the identification of additional phases. Additional sites that may belong to this era have been discovered along the edges of the Indus valley but have not yet been excavated. The Regionalization Era (5500 to 2600 B.C.E.) sees the emergence of numerous regional cultures throughout the greater Indus area. This relatively long period has been subdivided into many phases on the basis of distinctive pottery and other categories of artifacts (Kenoyer 1991; Shaffer 1992). Most sites reveal the presence of more than one phase, but it is not possible to deal with each of these in the course of this essay. Extensive trade networks were established along the major river routes and across mountain passes to connect settlements to each other and facilitate the movement of goods and raw materials. The later part of the Regionalization Era, often referred to as the Early Harappan Period or Kot Diji Phase (Kenoyer and Meadow 2000; Mughal 1992), represents a period of formative urbanism. The building of walled settlements, the use of specific types of painted pottery and ornaments, the appearance of seals and rudimentary writing, and expanded trade networks represent the emergence of more complex social organization and incipient urbanism (Kenoyer 2008).

The Integration Era has only one phase (Harappa Phase) that lasts around 700 years (2600 to 1900 B.C.E.; Kenoyer 2008). Excavations at Harappa have defined three subphases that correlate to major changes in settlement growth and organization. During the Harappa Phase, there is a synthesis of major regional polities into a larger integrated economic, political, and ideological system (Meadow and Kenoyer

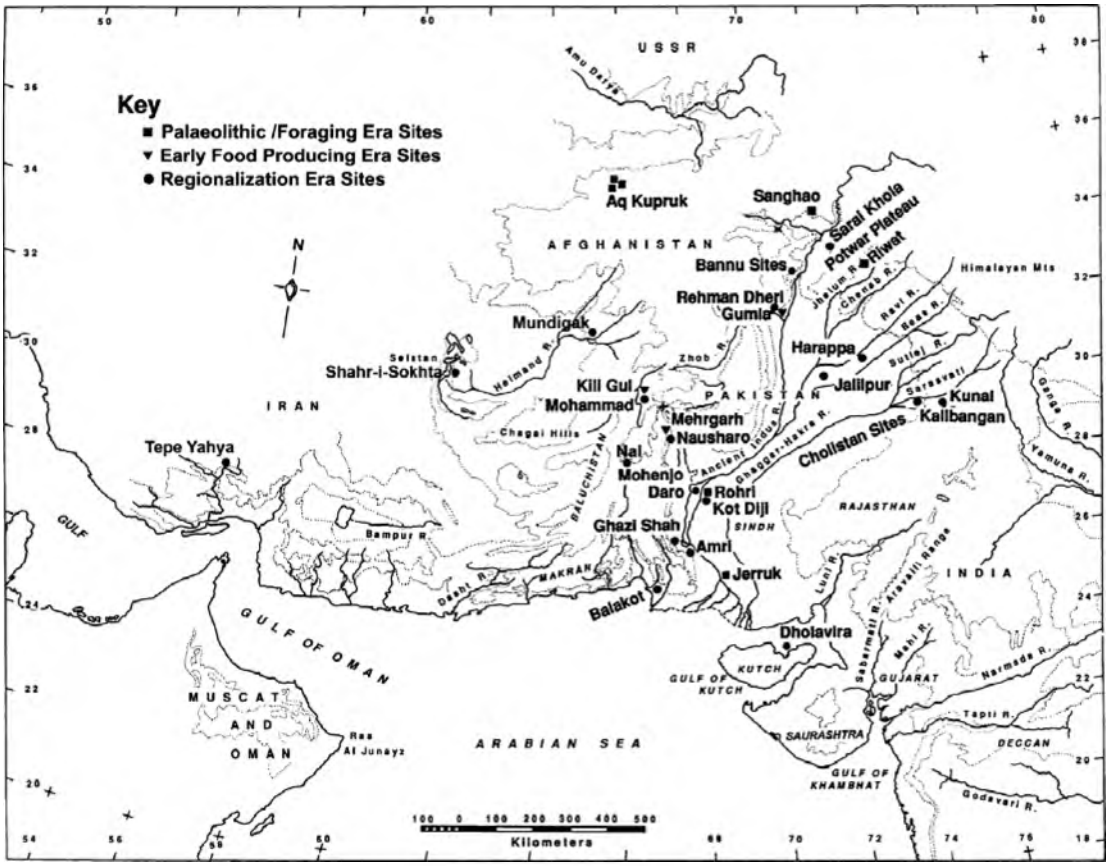
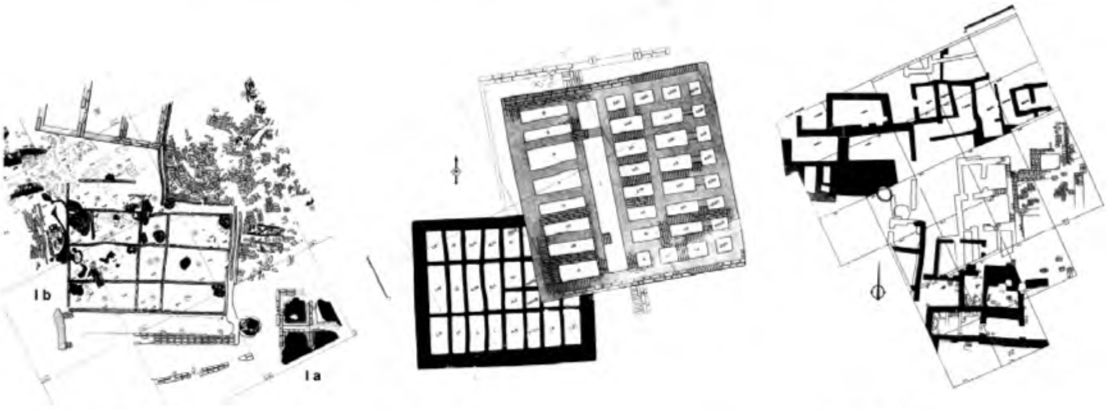


Fig. 1. Major Sites of the Indus Tradition: Early Periods.

2005). Extensive urbanism, characterized by large cities built with fired brick and satellite settlements made of mud brick, begins during this phase. Hierarchical social order and stratified society is reflected in architecture and settlement patterns, as well as artifact styles and the organization of technological production. The study of Harappan settlement planning is complicated by numerous periods of rebuilding and subdivisions of space, but it is possible to reach some general conclusions about Harappan households and neighborhoods. Although massive mud-brick walls surrounded most large settlements, there is no evidence for major conflict or warfare, as is common in other early civilizations. Because of the absence of specific types of monumental architecture, royal burials, and a highly centralized political system, some scholars prefer to see the Harappan culture as a non-state-level society (Possehl 1998), but others argue that it does in fact reflect a state-level society (Kenoyer 1991, 2008). The changes in household and neighborhood structures that can be identified during the process of urban development provide a new perspective on the socioeconomic and political structure of Indus urban centers.

Mehrgarh, Baluchistan

The site of Mehrgarh is the most extensively excavated site for this early period and provides considerable evidence for understanding the development of house-



a. Period IA and Ib b. Period III c. Period IV - VII

Fig. 2. Mehrgarh House plans (from C. Jarrige et. al. 1995: Figs. 4.2, 6.12, 8.20).
a. Period IA and IB; b. Period III; c. Periods IV–VII.

hold organization, beginning around 7000 B.C.E. (Early Food-Producing Era) through 2800 B.C.E. (Regionalization Era; fig. 1). Although no final report summarizes the nature of architectural and settlement organization over time, various excavation reports and short articles (J.-F. Jarrige 1993a; C. Jarrige et al. 1995) provide information that is summarized below. Mehrgarh is located at the base of the Bolan Pass that links the Indus alluvium to the highland plateaus of Baluchistan. Initial settlement at the site (Period 1A–1B, ca. 7000–6000 B.C.E.; J.-F. Jarrige 2000: 282) may have been seasonal, with communities moving to the cooler highland pastures in the summer and returning to the plains in the colder winter season. Eventually, a certain proportion of the population may have lived there year-round (J.-F. Jarrige 1985: 38). However, based on the repeated abandonment and rebuilding of structures throughout its history, it is quite likely that annual vertical transhumance continued to be practiced as an important subsistence strategy throughout the life of the settlement, much as it continues today in this same region.

The earliest settlement was an irregular scatter of mud-brick houses interspersed with open areas used for domestic and craft activities, passageways, and refuse dumps. Burials were found in between buildings and sometimes inside abandoned structures. Later structures were sometimes constructed above earlier buildings and burials, resulting in a very complex stratigraphic record and considerable disturbance of previous deposits (J.-F. Jarrige 1993a). The extent of the site during Period I is not known, due to overlying deposits, but by the end of Period II it may have covered more than 20 ha due to repeated shifting of occupation areas and rebuilding.

The earliest structures were made of hand-formed mud bricks that retained finger impressions and are found in small square- or rectangular-shaped foundations, with four or more internal subdivisions (fig. 2a). The mud bricks of Mehrgarh varied in size (28 to 42 cm in length) and proportion (average is 1 : 1.6 : 5.2). The houses were generally oriented north–south or east–west and stood alone or in groups of two or three buildings. The sizes of these structures range from 5.1 × 4.25 m to 6.6 × 5 m or 21.6–33 square m, but subtracting the wall thickness, the total interior space is only 13 and 22 square m, respectively. Some rooms had traces of fireplaces in the corners, with ash spread out onto the floor. Grinding stones and scattered domestic debris, such as bone and stone tools, charred grain, and faunal materials indicate that these rooms were occasionally used as cooking and living areas (C. Jarrige et al. 1995: 315–17). Generally speaking, however, it appears that the four-roomed structures were used as storage areas, primarily for barley and wheat, with limited access through narrow openings in the walls (J.-F. Jarrige 1993a: 28).

Later buildings (Period IB) were somewhat larger and were square or rectangular with internal subdivisions or chambers that also have been interpreted as storage areas. For example, one building was 6.2 × 7.8 m, with 20 smaller compartments. The small chambers in these larger compartmented buildings were sometimes plastered with red ochre clay, and the discovery of charred grain suggests that they were used for storage purposes (C. Jarrige et al. 1995: 453). The fill in these compartments sometimes includes grinding stones but is generally comprised of fallen mud brick and structural debris rather than domestic trash. This suggests that these structures were not used as a storage basement for an upper domestic building but were in fact dedicated storage facilities. There is no standard orientation to these buildings, and there is no evidence for overall site planning.

One unique structure was a long rectangular building (10 × 2.3 m) that had a thick wall on one side and a series of three long, rectangular rooms. At one end were numerous circular cylinders (36 cm diam.) of unfired clay that may represent the bases of clay plastered storage containers (C. Jarrige et al. 1995: 317). Outside the structures and often cutting into earlier structures are circular hearths and areas of domestic and craft activities.

In areas surrounding these structures and at the edges of the open areas, large concentrations of hearths and domestic debris suggest that relatively large numbers of people lived in the areas around these structures, possibly on a seasonal basis (J.-F. Jarrige 1993a: 28). Summer crops would have been harvested in the highlands in the fall, and winter crops would have been harvested in the spring in the Kacchi plain around Mehrgarh. Unfortunately, until more excavations in the highlands can be undertaken, it will not be clear if the storage structures at Mehrgarh were used all year or only seasonally (J.-F. Jarrige 1993a: 28).

During the subsequent ceramic Neolithic (Period II: 6000–5500 B.C.E., Regionalization Era) and in Chalcolithic Period III (fig. 2b), much larger compartmented buildings were constructed, and in some areas large curved platforms or revetment walls were constructed to create terraces to consolidate the eroding slopes of the mound. J.-F. Jarrige suggests that the construction of terraces and revetment walls to protect structures from flooding and erosion during Period II is clear evidence of a highly organized society (J.-F. Jarrige 1993a: 28). These revetments and terraces protect entire complexes of buildings or what could be called a neighborhood. The massive structure of some revetments represent a pattern of monumental architecture that is seen more clearly in later periods at Mehrgarh (Periods V–VII) and also in the massive mud-brick perimeter wall at the site of Nausharo, some 6 km to the south (J.-F. Jarrige 1993a: 33).

The large compartmented buildings were constructed in many different sizes and with varied internal subdivisions. Sometimes they had two rows of smaller compartments divided by a central corridor, and in other instances the entire building was divided into three rows of smaller compartments. Building sizes range from 4.1 × 3 m to 5.2 × 4.9 m to 7.7 × 7 m (Jarrige et al. 1995: 372). One of the larger structures is 8.8 × 8.8 m (76 square m), with 10 smaller compartments divided by a central corridor, which was itself divided by 3 walls, one of which had a door (Jarrige et al. 1995: 318). As with the previously described structures, these compartmented structures appear to have been used for storage and not as a foundation for a domestic superstructure. Post-holes in some areas indicate the construction of temporary shelters (C. Jarrige et al. 1995: 422), but there are no clear domestic structures associated with these later storage buildings.

This pattern of compartmented storage buildings and the construction of numerous revetment walls to protect the storage buildings from erosion continues at Mehrgarh through the subsequent Period III, which sees a horizontal expansion or shifting of the settlement, eventually extending over 100 ha in area (C. Jarrige et al. 1995: 373). During Period III, it is thought that mud bricks were made by using rectangular molds (J.-F. Jarrige 1993a: 29), but the actual sizes are not recorded, and in several publications it is clearly stated that the mud bricks are not of uniform size (C. Jarrige et al. 1995: 515). Circular kilns have been found along what appears to have been an eroding slope at the southwestern part of the settlement. This location is particularly important because it indicates the location of pyrotechnical crafts away from storage facilities that could catch fire if windblown cinders were to land on thatch or wooden roofs.

Mehrgarh, Periods I–III: Subsistence, Crafts, and Ideology

Due to limited space, it is not possible to discuss all aspects of early Mehrgarh, but it is important to address specific features that shed light on the nature of households and neighborhoods. The basic subsistence during much of Period I and Period II was based on the harvesting of wild barley, as well as cultivated wheat and barley, supplemented by hunting of wild animals and to some extent pastoralism of sheep/goat and possibly some cattle (Costantini 1984; Meadow 1993).

Most of the craft technologies identified at the site are associated with the production of stone-blade tools, polished stone adzes and bone tools, basketry, and clay containers (C. Jarrige et al. 1995). During Period I, no pottery was produced, but it gradually came into use during Period II. Discarded tools and some lithic and bone debris from manufacture was generally found outside the mud-brick structures, in open areas associated with hearths and refuse pits. Numerous ash layers filled with fire-cracked rock indicate that some foods, such as grain and stews were cooked in skins or bitumen-coated baskets with hot rocks.

The early inhabitants buried their dead in open spaces between the houses and over time built new houses on top of earlier burials. The graves were made by digging a vertical shaft and then excavating a side chamber. The corpse was placed in the chamber, lying on its side in a flexed position. The chamber was usually walled up with mud bricks and the shaft refilled (Samzun and Sellier 1985). Utilitarian objects included with the dead may have been intended for the afterlife but provide a unique window on the daily life of the ancient inhabitants. These funerary offerings were usually placed around the head or at the feet of the individual and include a variety of tools, stone and bone, bitumen coated baskets, and a wide variety of ornaments. In some of the earliest burials dating to about 6500 B.C.E., young goats were slaughtered and buried with the dead. Children and women tended to be most heavily ornamented, but even male burials contained some ornaments. Some adult females were buried with wide shell bangles made from *Turbinella pyrum,* a species found only along the coast near Karachi (Kenoyer 1995a). Other ornaments include composite bracelets, anklets, and necklaces made from beads of shell, bone, and stone. The raw materials for the ornaments include locally available yellow-brown limestone as well as exotic materials, such as malachite/copper, lapis lazuli, turquoise, black unfired steatite, white fired steatite, red-orange carnelian, banded agate, and various species of marine shell (Barthélemy de Saizieu 2003).

There is no evidence for local manufacture of ornaments from exotic materials during Period I, and this indicates that the early inhabitants had wide connections through annual migrations or trade. Various species of shell can be traced to the Makran coast and possibly even across the Persian Gulf to Oman. The different types of stone beads are evidence for trade with central and northern Afghanistan as well as northeastern Iran.

During Period II, pottery-making becomes widespread at Mehrgarh, and scatters of unfinished steatite and lapis beads (Tosi and Vidale 1990; Vidale 1995) and marine shell ornaments provide the first evidence for local production of exotic raw materials (Kenoyer 1995a). This pattern continues into Period III, when large kiln structures and concentrations of drills and raw material debris provide evidence for a dramatic growth in local craft traditions (C. Jarrige et al. 1995).

Mehrgarh Early Households

The early periods at Mehrgarh reveal a trajectory of household and neighborhood organization that centers on a mud-brick storage structure surrounded by domestic and craft activities. The earliest basic structure was a simple four-roomed building, which may have been the focus of a single subsistence unit or household. However, this structure was supplemented by adding a second and third building, indicating either a growth in overall size of subsistence units or cooperation between two or more groups or households. Eventually, a new layout emerged, with compartmented buildings that were significantly larger and subdivided into many smaller units. It is not possible to determine if these buildings were for single households or complex, extended households. However, the grouping of several of these structures together on terraces that were protected by revetment walls suggests that larger social organizations were emerging by the end of Period II and on into Period III. Based on the published reports, it is not possible to determine if certain groups were engaged in specific crafts, but the location of large kilns to the south and west of the settlement suggests that some degree of segregation of crafts was practiced. This may have been due to safety concerns relating to pyrotechnology, or it could reflect functional requirements related to the proximity of water or clay or even dumping areas. While there are still many unanswered questions regarding this early period, it is clear that major changes started to take place at Mehrgarh in subsequent periods. Furthermore, it is possible to contrast the patterns seen at Mehrgarh with those seen at other sites in the Indus region.

Regionalization Era

The later periods at Mehrgarh (Periods IV–VII, ca. 3500–2600 B.C.E.) and the nearby site of Nausharo (NS Period I, ca. 3000–2500 B.C.E. = Mehrgarh Period VII) represent major changes in settlement organization and layout. During Period IV (ca. 3500 B.C.E.), Jarrige reports a "spectacular increase of small and medium-size sizes all over the Kacchi-Bolan area. It seems that vast aggregations occupying in an extensive fashion immense surfaces were succeeded by more compact and numerous settlements" (J.-F. Jarrige 1993a: 31). At Mehrgarh, there is possible evidence for the construction of irrigation ditches that may have been critical to agricultural intensification and, eventually, population growth.

Architectural traditions undergo a major change at this time, reflecting a transformation in the organization of the household. Instead of large compartmented storage buildings surrounded by scatted hearths and craft areas, the Periods IV and V architecture is made up of multiple rectangular rooms of different sizes, built up around a central courtyard (fig. 2c; J.-F. Jarrige 1993a: 31). Low doors (0.75–1 m high) allowed access into rooms, and some structures were covered with small beams covered with plastered reeds. This type of roofing suggests that there may have been living areas on the flat roofs, as is seen with traditional buildings throughout the region today. Small lanes allowed access between the larger complexes, but there is no evidence of a master plan of the overall settlement. These structures are oriented in a general north–south and east–west direction but not on a grid plan (C. Jarrige et al. 1995; J.-F. Jarrige 1989).

The general pattern of these complexes suggests that they were inhabited by people who were engaged in a wide range of overlapping domestic and craft activities. Large storage jars were placed in many rooms and courtyards and presumably were used for storing water and other food items. Circular and now rectangular hearths, as well as clay and pottery oven-like (tandoor) structures were distributed in various rooms and open areas. Due to the complex stratigraphy and reuse of these areas, it is not possible to sort out the chronology of different cooking and craft areas, but there are some examples of abandoned buildings being reused for intensive craft activities. Craft activities such as bead-making and faience production (Barthélemy de Saizieu 2003; Barthélemy de Saizieu and Bouquillon 1997) were carried out within these building complexes, but some craft debris is also found in the lanes and exterior areas. However, large-scale craft production associated with pyrotechnology, such as pottery-making, appears to have been segregated from domestic areas. A large pottery-firing area filled with vitrified pottery from a failed firing was found in an open area (Santoni 1989), and some 1000 to 2000 m west of the habitations of Period IV–VII (MR.1 mound), a series of updraft kilns were located (C. Jarrige et al. 1995: 461–62; Pracchia 1985). During this period, there is a great deal of pottery production, copper-working, stone-bead and shell-ornament production, and faience production. All of these crafts reflect specialized technologies that were probably not practiced by each household. Although no final publication has summarized the distribution of crafts during Periods IV–VII, the field reports suggest that some complexes were associated with pottery production, while others may have been engaged in bead-making (Vidale and Lechevallier 1994) or other crafts (C. Jarrige et al. 1995).

Nausharo, Baluchistan

The site of Nausharo, Baluchistan, is located approximately 6 km south of Mehrgarh, and the artifacts and architecture are identical to those at Mehrgarh (Period VIIC, ca. 3000–2600 B.C.E.; fig. 1). It is not clear if Nausharo was a splinter settlement or if it was founded by a new community of related people who used identical types of materials objects. Both of these interpretations can be associated with major social and political developments resulting from population pressure on existing agricultural land or because of other ideological or economic tensions. Mehrgarh continued to be inhabited until around 2600 B.C.E., which signals the beginning of the Harappa Phase, after which Nausharo emerged as the main town in the region.

Although a final report of the architecture from the initial occupation of Nausharo has not been published, preliminary reports (unpublished) and some published articles do provide a glimpse of the changes that were taking place at the site (J.-F. Jarrige 1993b; C. Jarrige 1994, 2000). The 6-ha mound is badly preserved due to erosion and the removal of soil by local villagers. It has a higher northern portion (9 m) that is due to the presence of considerable occupation deposits of Period I (3000–2500 B.C.E.), and a lower southern portion (6 m) with a mud-brick perimeter wall along the eastern and southern edges of the mound. There are some continuities in the types of pottery, stone tools, and some of the architectural features from the pre- or Early Harappan occupation (NS I) to the subsequent Harappan occupation (NS Periods II and III) (C. Jarrige 1994, 2000). One of the main features that may reflect household organization at Nausharo is the arrangement of buildings into multiroom units sometimes associated with a courtyard and the presence of cooking hearths and storage jars inside the buildings. During the initial settlement, there is no evidence for centralized planning but, instead, multiroom houses separated by small lanes were oriented in generally north–south and east–west direction. Some courtyards and open areas with evidence for hearths/kilns or craft activities were found in between clusters of rooms. This layout was very similar to that seen at Mehrgarh, Period VII (fig. 2c).

However, at Nausharo, sometime before 2500 B.C.E., a large area of the upper mound was destroyed by fire. Thanks to the collapsed roofs and walls, most of the houses were preserved with all of their objects *in situ*, allowing a detailed reconstruction of the use of space and identification of the places where pottery and other artifacts were stored or used (J.-F. Jarrige 1993b, 1997; C. Jarrige 2000). It is not clear if this burning was the result of intentional conflict or simply an accidental fire. Soon after the fire, the site was rebuilt on a slightly different plan, with houses oriented approximately along the cardinal directions (north–south and east–west). This subsequent occupation of the site (NS Period II and III) is associated with the urban Harappa Phase, and new features include well-planned blocks of buildings that are internally subdivided into smaller multiroom housing units (23–72 square m in area), with separate entrances from lanes or streets (fig. 3; C. Jarrige 2000: 241). Detailed studies of reconstruction sequences within specific house units (C. Jarrige, personal communication) show how a delimited area was repeatedly reorganized through the building of small divider walls, drains, and the construction of new entrances. The overall space remained basically the same, though it is possible that a second storey allowed the inhabitants to expand vertically rather than horizontally.

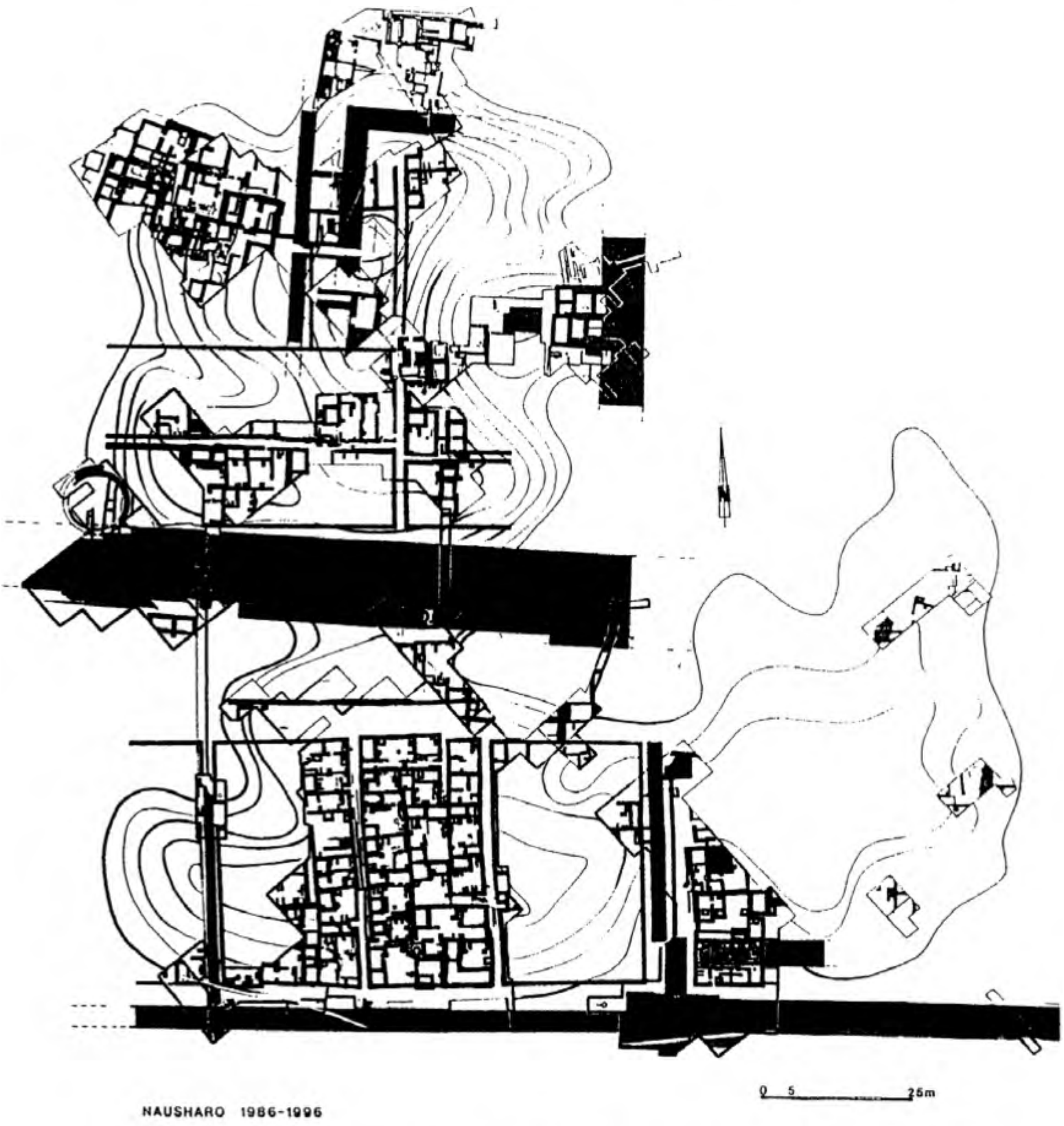


Fig. 3. Nausharo, Periods II and III, Harappan Phase (from C. Jarrige 1994: fig 3).

Many of the houses had a rectangular mud-brick fireplace, with two circular hearths situated in open areas along the east wall or at the northeast corner of the building. This is not surprising, since this part of the house would be the first to get the morning sunlight, but it is a pattern that will be seen at other Indus sites, such as Harappa. Most houses also had cylindrical clay storage containers or narrow cupboards that were rebuilt and repaired as the house floors were gradually filled in and raised. Some of the houses had "foundations of large wooden beams set on and in stones and embedded in clay" (J.-F. Jarrige 1993a: 33). Every house had a bathing area, with a floor made of a variety of water-resistant materials such as fired brick, pottery sherds, flat stones, or wooden planks. A drain made of fired bricks, wooden planks, or interlocking terracotta pipe sections emptied from the bathing area into a large sump pot or brick-lined sump pit set into the street (C. Jarrige 2000: 244–45). The blocks of houses were divided by major streets (4–5 m wide) and smaller lanes (1.5 m wide), and the streets were equipped with drains made of fired bricks. Wedge-shaped bricks found reused in many bathing floors and drains indicate that specially lined wells were located somewhere in the settlement but have not yet been located.

A brick-lined spillway drain coming out of the settlement was constructed across a 0.55-m-wide mud-brick platform that could represent part of the edge of a canal or water tank (J.-F. Jarrige 1993a: 33). The settlement itself is surrounded by a massive mud-brick perimeter wall (5–6 m wide), still preserved along the eastern and southern edges of the mounds. During the Harappan period, access into the settlement is provided by an impressive southern gateway that is 3.12 m wide.

At present, the only craft production reported from Nausharo is pottery production, but the discovery of numerous stone tools, copper tools, stone and shell ornaments, and terracotta figurines suggests that other unexcavated parts of the site were devoted to these other specialized crafts. Pit kilns for pottery production have been discovered outside the southern wall of the northern mound (dating to Period IC) as well as within habitation areas in the southern part of the lower southern mound (dating to Periods II and III). In this area, pottery production was clearly a household craft and continued to be practiced in the same general area of the site for hundreds of years, spanning Periods II and III (C. Jarrige 2000: 251–53). Several pottery kilns were constructed in domestic courtyards and the nearby street in the southern part of the site—but still within the limits of the southern city wall. Four different updraft kilns were constructed at different times in one housing unit, and two other kilns were located nearby in a building across the lane and in the adjacent street. These kilns can be directly correlated to pottery tools and unfired pottery found in adjacent rooms of the same building.

The changes in household organization at Nausharo suggest that the initial inhabitants of the site during Period I were relatively free to construct their habitation areas and practice craft activities without much interference from city planners. With the beginning of the Harappan phase, Period II (ca. 2500–2300 B.C.E.), and even more so in Period III (2300–2100 B.C.E.), there appears to have been considerable regimentation and restrictions in the organization of households and groups of houses that formed specific neighborhoods. The location of pottery kilns at the southern edge of both the northern mound and the southern mound suggests that some segregation of pyrotechnological activities was taking place. While this may have been defined by urban planners or elites, it also may have been a functional or practical segregation due to the generally prevailing north wind that would certainly blow smoke and cinders away from habitation areas (Kenoyer 1989; Kenoyer and Miller 2007). The pit kilns on the northern mound would have been abandoned prior to the occupation of the southern areas. The generally uniform location of hearths and the construction of bathing platforms within each house also reveals an important new feature of household organization that is difficult to explain. These features could represent the arrival of a new ethnic community with a different ideology than was seen in earlier periods or simply the evolution of a widespread pattern of domestic behavior that was gradually spreading throughout the Indus Valley region and parts of Baluchistan. In order to provide a broader context for discussing

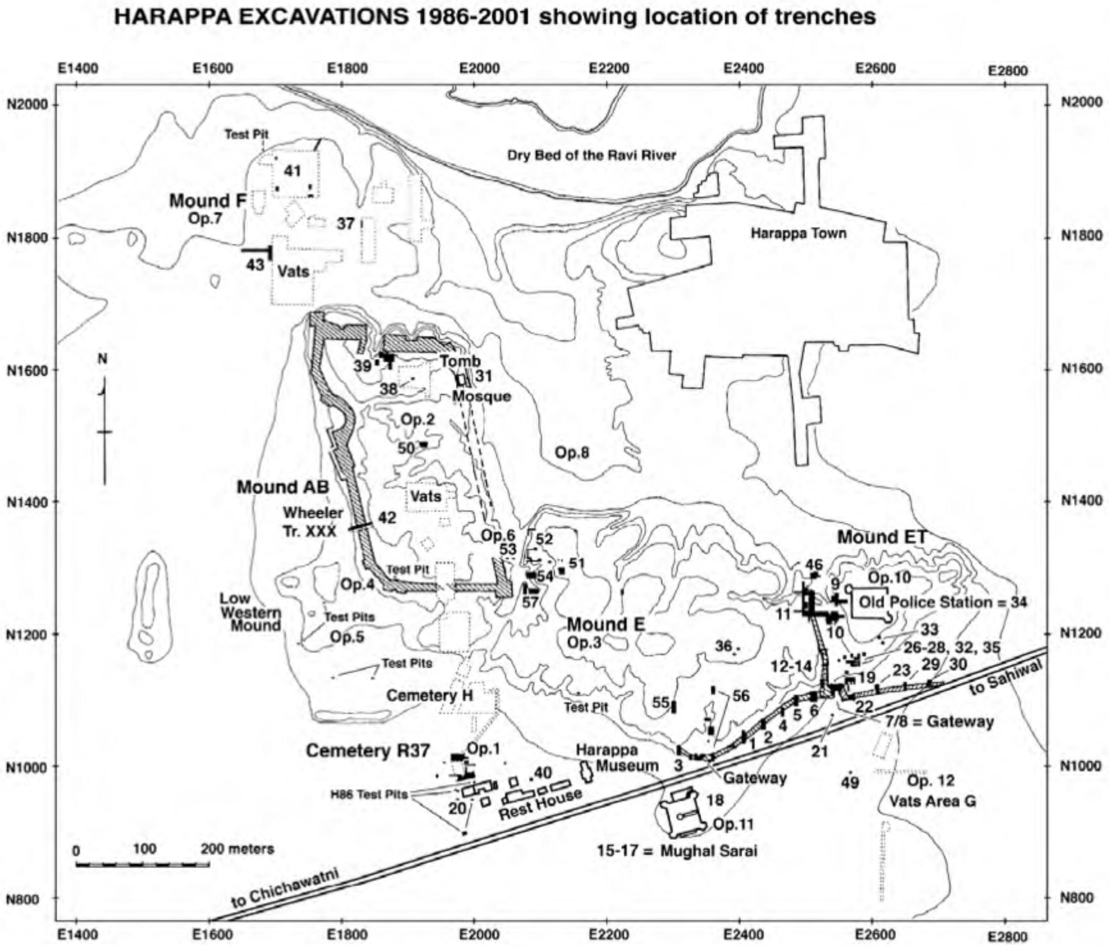


Fig. 4. Harappa. General plan of excavations areas and periods.

these patterns, it is important to review the evidence from the site of Harappa, which also has a very long sequence of occupational development.

Harappa, Punjab

Harappa is located in the northern Indus plain, situated on a Pleistocene ridge between the Ravi and the ancient Beas Rivers, which were tributaries of the Indus River (fig. 1). The currently preserved mounds spread out over 150 ha and are made up of three relatively high mounds (AB, E, and modern Harappa Town), as well as several lower mounds that were suburbs of these elevated settlement areas (F, ET, and other smaller mounds; fig. 4). Since 1986, excavations at the site by the Harappa Archaeological Research Project have uncovered important new evidence for the emergence of the urban center and the processes that led to settlement growth, organization, and decline (Kenoyer 2008; Meadow and Kenoyer 2005). A brief summary of key features relating to household and neighborhood organization will be presented below, along with comparisons with other sites in Pakistan and India.

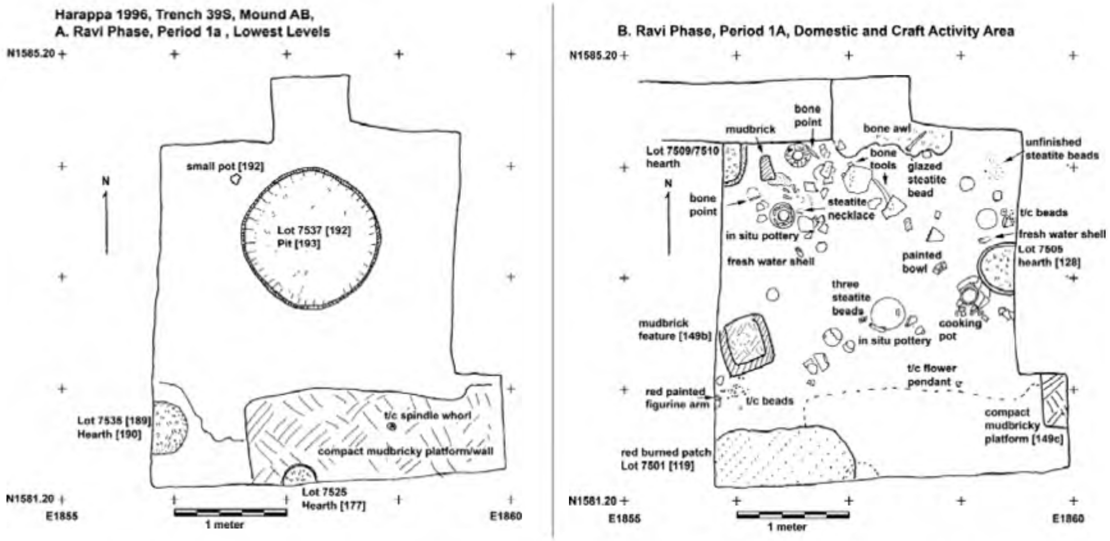


Fig. 5. Harappa, Ravi Phase. a. Lower levels. b. Cooking area and crafts.

Harappa – Early Harappan, Ravi Phase Domestic Structures

The Early Harappan Period at the site of Harappa is divided into two phases, the Ravi Phase (> 3700–2800 B.C.E.) and the Kot Diji Phase (2800–1900 B.C.E.). These occupations are roughly contemporaneous with Mehrgarh Periods III–VII and Nausharo Period I (Table 1). There is little or no indication of shared cultural features between Harappa and the sites in the Kacchi Plain during the Ravi phase but there is more evidence for interaction during the Kot Diji phase.

The Ravi phase occupation grew to around 10 ha in area and may have been divided into two sectors or settlements divided by an erosion gully. The occupation can be chronologically divided into two subphases based on pottery: handmade pottery, which is predominant in Period 1A, and wheel-thrown pottery, which begins to appear in Period 1B. For the purposes of this chapter, all Ravi-phase artifacts are presented together. There is no clear stratigraphic division between the Ravi and the Kot Diji phases, and they appear to represent a continuous sequence of cultural development. The material evidence that provides clear linkages to the later Kot Diji phase include the thickness : width : length ratio of the mud bricks (1:2:4) and layout of architecture along the cardinal directions, as well as the technological and stylistic aspects of pottery-making and other specialized crafts. Terracotta- and shell-bangle-making of the Ravi Phase continues into the Kot Diji period, as does the production of spindle whorls, animal figurines, and stone beads. Pottery with pre-firing, potter's marks, and post-firing graffiti are also present during the Ravi phase, and it is possible to see some evidence of continuities in graffiti on pottery into the Kot Diji phase (Kenoyer 2006; Kenoyer and Meadow 2000).

The excavation of the Ravi-phase habitation areas at the northern edge of Mound AB was limited to relatively small areas of horizontal exposure in two areas, Trench 39N (46 square m) and Trench 39S (9 square m; figs. 5 and 6). While it was not pos-

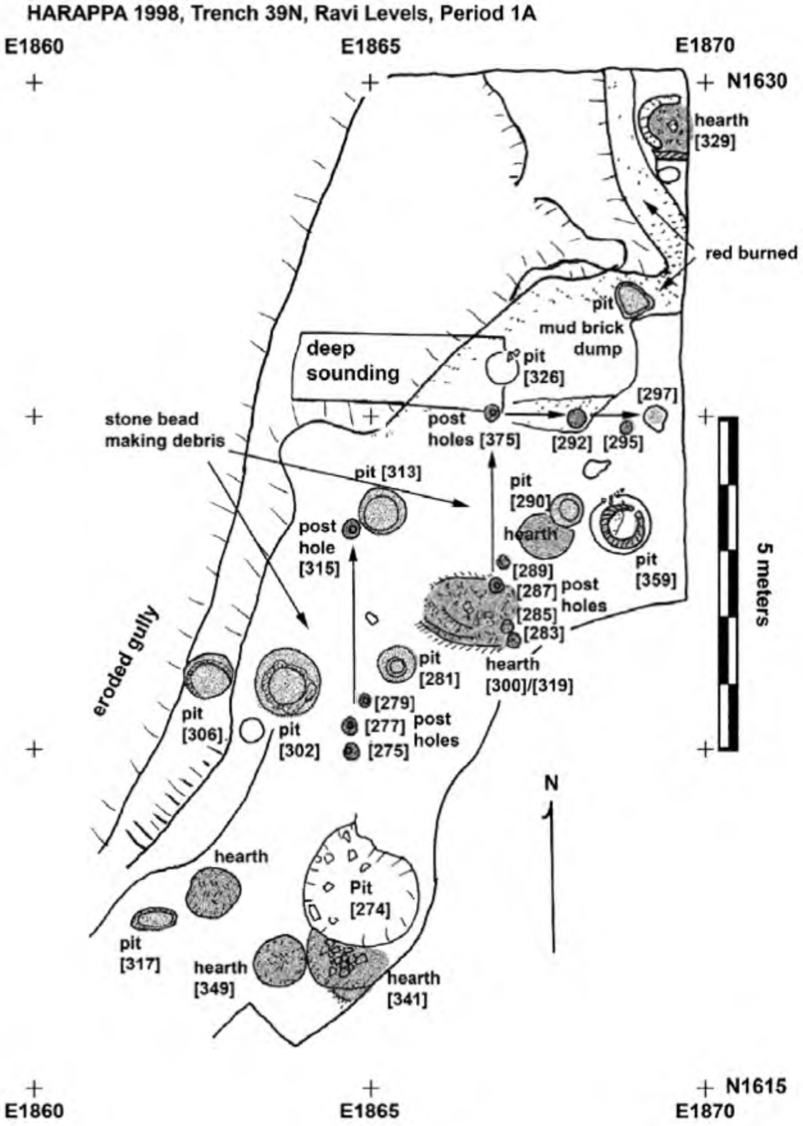


fig. 6. Harappa, Ravi Phase: post-holes, hearths, and pits.

sible to expose entire structures or determine the overall layout of the occupation, it was possible to define specific elements that reveal some architectural features and a variety of domestic and craft activities associated with households (fig. 5). Structures made with posts and walls of reeds with mud plaster could be identified in one area of the site (fig. 6). The alignments of the posts are north–south and east–west, suggesting the construction of rectangular huts, though the posts may also have been used for drying racks or even divider walls. The use of mud bricks for the construction of houses with north–south and east–west oriented walls is also attested from two different areas of the excavation. These walls were made from relatively large mud bricks (11 × 23 × 40 cm) and reveal the standard ratio of 1:2:4 that becomes common in the later Kot Diji and Harappan Periods. Smaller hand-formed mud bricks were also roughly 1:2:4 (4.5 × 9 × 17.5 cm). They were found in a dump along with pottery wasters and may have come from a dismantled kiln or hearth structure

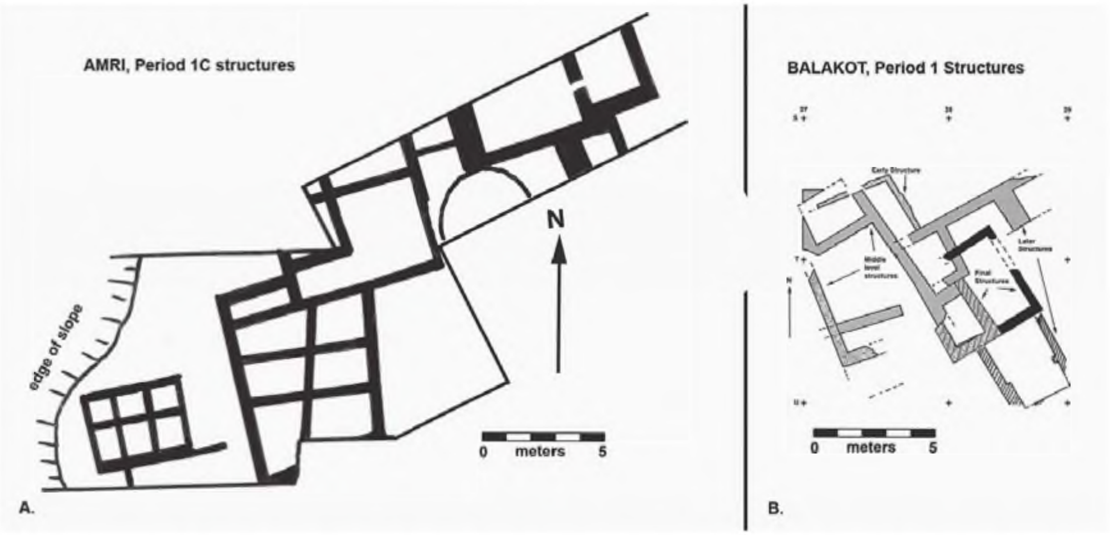


Fig. 7. Regionalization Era mud-brick structures: a. Amri, Period 1C. b. Balakot, Period I.

(fig. 6). The sizes and shapes of the mud bricks from the Ravi phase are quite different from those seen at Mehrgarh, and the fact that structures were oriented along the cardinal directions suggests that the architectural traditions of both sites are relatively distinct and independent.

There are other early sites that have evidence for mud-brick structures at approximately the same time. Amri in Sindh (fig. 7a; Casal 1964) has some multi-room structures that are oriented in roughly north–south and east–west directions and look very much like the early buildings at Mehrgarh during Period 1b through III. The site of Balakot also has early mud-brick structures with one or more rooms, but these were not aligned in any uniform direction and the full plans were not revealed due to the limited area of excavation (fig. 7b; Dales 1979).

In contrast to these sites in Baluchistan and the Indus valley, it is important to note that circular and irregular pit houses have been identified at sites to the northeast of Harappa, along the now dry bed of the ancient Saraswati River and its tributaries. Pit houses at Kunal (Period 1A, 1B) were between 2 and 3 m in diameter and dug up to 1 m below the surface (3000–2800 B.C.E.; Khatri and Acharya 1997, 2005). During Kunal 1C, there is evidence for rectangular or square mud-brick structures using bricks having a ratio of 1:2:4. At Girawad, there were irregular and circular "pit-houses" of different sizes associated with large rubbish pits (4000–3000 B.C.E.; Shinde et al. 2008: 95–102). The pottery associated with both sites is generally comparable to the hand-formed early pottery from the Ravi and some later wheel-thrown pottery dating to the Kot Diji phase.

Although the sample size is quite small, there does seem to be some degree of regional diversity in the nature of domestic structures during the initial settlement of the Indus region. From Mehrgarh, Amri, and Balakot, all located along the piedmont and western edge of the Indus Valley, we see a range of mud-brick structures used for either storage or possibly habitation. At Harappa, situated in the central Punjab, post-hole structures and mud-brick houses are oriented along the cardinal directions. At Girawad and Kunal, in the Eastern Punjab, a wide range of pit dwellings are present. It is unlikely that the diversity in structures in these three broad regions can be attributed to major differences in subsistence patterns, since all of the settlements appear to represent agro-pastoral communities. One possible explanation is that the cultural perceptions of space and the organization of households many have been regionally distinct during this period.

Returning to the discussion of the Ravi houses, it is important to note that numerous specially constructed storage pits were found in association with the post-hole and mud-brick structures. The storage pits at Harappa include circular pits with chaff-tempered plaster (1.2–1.8 m diam.) and distinctive bell-shaped pits with red ochre clay lining (50–70 cm diam.). Traces of charred grain in some of the pits suggests that they were used for food storage. No other sites report these types of pits, and they disappear at the end of the Ravi phase.

Other indicators of domestic activities are the location of hearths that were filled with fired clay lumps, soot-darkened pottery, and charred faunal remains. Some hearths were made by digging a shallow pit that was oval or circular in shape. In many cases, hearths appear to have been used repeatedly over a considerable period of time, with phases of ash and burning separated by layers of pottery sherds and burned clay lumps. In one excavation area, multiple hearths were discovered one above the other in a relatively small area of a house or courtyard, indicating that domestic space was used in the same way for long periods of time. The hearths and associated pits are generally filled with broken cooking-pots with blackened exterior surfaces, along with charred grain (wheat, barley, and a variety of millets and pulses; Weber 2003) and animal bone (sheep/goat and cattle; Meadow and Patel 2003). Other hearths were simple scatters of ash lying on top of red-burned and blackened floors. This suggests that people often would make a fire wherever needed.

One important difference between Harappa during the Ravi phase and the site of Mehrgarh that should be pointed out is the absence of burials within the habitation areas of the site. Although only a small area has been excavated, there is no indication during this or subsequent Kot Diji and Harappan phases that people were being buried within the settlement. During the Harappan Period, the dead were buried in a cemetery located to the south and west of the main settlement. It is not unlikely that the Ravi and later Kot Diji dead were also being disposed of outside of the settlement, but we do not know what methods were being used during the Early Harappan Period.

Ravi Phase Domestic Activities and Specialized Crafts

During the Ravi phase, a wide variety of crafts were practiced at the site, and all evidence suggests that they were practiced within or adjacent to domestic areas (Kenoyer and Meadow 2000). The discovery of a dump of hand-formed mud bricks along with vitrified sherds and kiln drips suggests that the distinctive hand-formed pottery was being made at the site. A large number of bone tools were recovered, including bone points for projectiles and bone awls and polished rib bones that may have been used in the production of baskets and woven textiles. Fired terracotta spindle whorls in different sizes and weights have also been recovered in all the localities. Relatively few chipped-stone tools were recovered in association with the domestic areas, but they include geometric microliths (trapeze and backed blades) that would have been hafted in composite tools, as well as simple retouched blades and scrapers. Fragments of ground-stone tools such as celts, mullers, grinding stones, and hammer stones were also found in association with domestic areas. The presence of a wide range of food processing, subsistence, and domestic crafts (spinning, weaving, pottery-making) indicates that people living in the household were involved in a wide range of activities and were probably relatively self sufficient.

In addition to the activities outlined above, there is evidence for the production of objects that relate to ideology and the creation of wealth indicators. Fired clay was used to make beads, bangles, and a variety of other ornaments, as well as both animal and human figurines. A large cache of terracotta beads found in one area may indicate the production of these objects within the domestic context. A second collection of terracotta beads appears to have been strung on a cord and apparently abandoned on the floor.

One of the most important discoveries is the evidence for specialized stone bead and glazed steatite bead production (Kenoyer 2005a). Manufacturing debris and stone microdrills from the production of a variety of hard stone beads (lapis, agate, carnelian, jasper, amazonite) was located in one area, and in another there is evidence for soft steatite bead-making. Some of the steatite beads were hardened by firing (around 1000° C) and some were glazed with a green colored silica glaze (around 930° C). The firing of steatite does not require a specialized kiln; however, it was not done in a common cooking hearth (Kenoyer 2005b). Traces of vitrified glaze slag and unfinished beads were located among the normal cooking-pots and hearths in a domestic courtyard, but the actual firing may have taken place farther away in an open space outside the house or at the edge of the site.

A few fragments of copper ornaments and tools and possibly some copper prills from melting activities may point to the local production of copper objects, but no crucibles were discovered in the limited excavations. Another significant craft that would have involved specialized tools was the production of shell bangles from exotic marine shell (Kenoyer 1995a). A few fragments of marine-shell-manufacturing waste suggest that this too was taking place at the site.

Although local materials were used for pottery and terracotta ornament production, all of the other crafts involve the use of exotic raw materials that would have been acquired through long-distance trade. Studies of raw material sources indicate that most of the raw materials used at Harappa during the Ravi phase came from regions to the north (Law 2008), though some chert could have derived from the southern Indus plain at Rohri. Marine shell would have come from the coast near Karachi (Kenoyer 1995b).

One of the key questions that will need to be investigated through future excavations is the role of specialized crafts at the site during the Ravi phase. There is clear evidence for intensive stone bead and steatite bead production, but it is not known if these beads were made for local consumption by the household or if they were produced for trade to regional sites. A number of sites from this same period have been found in the region, the closest being Rajanpura and Hissoka (75 to 83 km to the north) and Jalilpur (77 km southwest; Mughal et al. 1996). Additional sites from this time have been identified in Cholistan along the Ghaggar-Hakra-Sarawati River to the south (Mughal 1997) and further to the northeast in the upper reaches of the same river (Shinde et al. 2008).

Unlike later periods at Harappa, there is no evidence for the use of seals and sealings for controlling the storage or distribution of goods. A single fragment of a possible swastika button seal could have been used for decoration or ideological purposes. Some pottery is incised with prefiring potter's marks, while other vessels are inscribed with postfiring graffiti. The button seals and early writing suggest that some individuals were beginning to use these technologies to codify information and communicate, but the use of these technologies to document or control production and redistribution does not become formalized until the later Kot Diji and Harappan phases.

Kot Diji Phase: Settlement Organization and Households

At the site of Harappa, around 2800 B.C.E., we see the emergence of what has been defined as the Kot Diji phase on the basis of pottery styles, architecture, and a number of other diagnostic artifacts (Kenoyer 1993; Meadow and Kenoyer 2005). There is considerable cultural continuity between the late Ravi and early Kot Diji phase, and no stratigraphic hiatus has been identified in the excavations at Harappa. This suggests that the social and economic processes that led to the transformation of the cultural assemblage were quite gradual. The occupation, however, did grow considerably and expanded to an area of more than 25 ha. The occupied area was divided into two distinct walled mounds: Mound AB (approximately 6 ha walled area) and Mound E (approximately 10 ha walled). The two occupation areas were enclosed by massive mud-brick walls oriented in the cardinal directions. Though gateways have not yet been identified for either Mound AB or Mound E, we can assume that they would have been used to control access into and out of the settlement (Kenoyer 2008).

The earliest perimeter wall around Mound E was around 2–2.5 m wide at the base and may have stood as much as 4 m in height. A rough estimate of its length based on test trenches at different parts of the mound suggests that it may have been at least 1,500 m in total length. Estimates of construction time and effort based on modern mud-brick production rates at Harappa suggest that 61 people could build approximately 17 cubic m in one day. Using this calculation, it would take 29.4 months to construct the city wall, but since the optimal construction time is during the winter months, after planting the winter crops, I have used a window of three months for massive construction works. Thus, approximately 600 highly motivated and well-organized people could have constructed the early city wall in about 3 months' time. We do not know how long it actually took, but these estimates provide insight into the nature of household and community cooperation or mobilization that would have been required to construct the wall of Mound E at Harappa.

In terms of house construction, the Kot Dijian houses were made almost exclusively of small mold-made mud bricks (7 × 14 × 28 cm). There is no evidence for the use of fired bricks during this time at Harappa, though it is possible that fired bricks were used for drains at the site of Kalibangan in Period I, which corresponds to the Early Harappan Kot Diji Phase at Harappa (Lal 1979). At Harappa, the mud-brick platforms used to consolidate the eroding edges of the settlement and the massive city walls that surrounded both Mound AB and E, were made from larger mud bricks (10 × 20 × 40 cm). Both sizes of mud bricks conform to the 1:2:4 ratio that was established during the earlier Ravi phase. The layout of the settlement is based on a north–south and east–west grid, with large streets more than 5 m wide as well as smaller lanes. The houses are oriented along the streets, but very few complete rooms, and no complete structures, have been exposed for the Kot Diji phase at Harappa due to overlying sediments and later disturbance from the Harappan Period.

Based on the fragmentary structures, however, it is possible to determine that houses were made up of multiple rectangular or square rooms associated with courtyards. The presence of hearths and storage pots can be defined in rooms adjacent to the streets, while hearths and small kilns for making terracotta figurines or bangles have been discovered in open areas or courtyards (Kenoyer 1993). On Mound E, which was a separate, walled sector, another small kiln that may have been used for firing black (reduced) bangles was discovered, in association with some fragmentary domestic buildings. This suggests that people of separate, walled sectors were engaged in similar crafts, probably to supply local demand in their neighborhoods or local market.

Many of the storage vessels found in the rooms were reused as trash pits. Rooms were periodically filled in and floor levels raised to keep the houses from being buried by the gradual build-up of street debris. This build-up resulted from trash thrown out into the street and erosion of mud-brick houses, which leaves thin layers of silty clay on the streets. The streets at Harappa were not paved and did not have well-defined drains. On Mound AB, a wide, shallow gully (or street with open drain) flowed from south to north as an irregular shallow channel. In the bed of the channel, patches of ashy dump were found interspersed with pottery scatters and green-stained silty wash that indicates the presence of stagnant water (Meadow and Kenoyer 2005).

Numerous indicators of specialized craft production were discovered in the street debris as well as in some of the open courtyards adjacent to the street. Numerous stone flakes from exotic materials (agate, lapis, steatite) and unfinished beads and drills indicate that bead-making continued to be an important technology that was practiced within domestic neighborhoods. Other craft indicators include steatite bead-making debris, shell-manufacturing debris, and some pottery wasters.

One of the most important discoveries in the street debris was an unfinished steatite seal with an elephant motif. Earlier button seals may have been used for ideological purposes, but seals with an animal motif and script are thought to be indicators of power, wealth, and identity (Kenoyer 2000). A terracotta sealing with script impression was found in a hearth next to the street and a small cubical stone weight was found in a small pit in a nearby room. Finished objects that reflect production somewhere else in the site or the region include faience beads, gold sequins, a range of terracotta bangles, beads, and figurines, bone tools, and spindle whorls. Together, these artifacts indicate that communities living in one area of Harappa (Mound AB north) were beginning to use a wide variety of ornaments, including precious metals and faience. They were also using devices that indicated power and control-like seals, weights, graffiti, and sealings. Other areas of Harappa where the Kot Diji levels were exposed did not have the same richness of craft debris and finished artifacts as were seen on Mound AB. This suggests that some neighborhoods were becoming

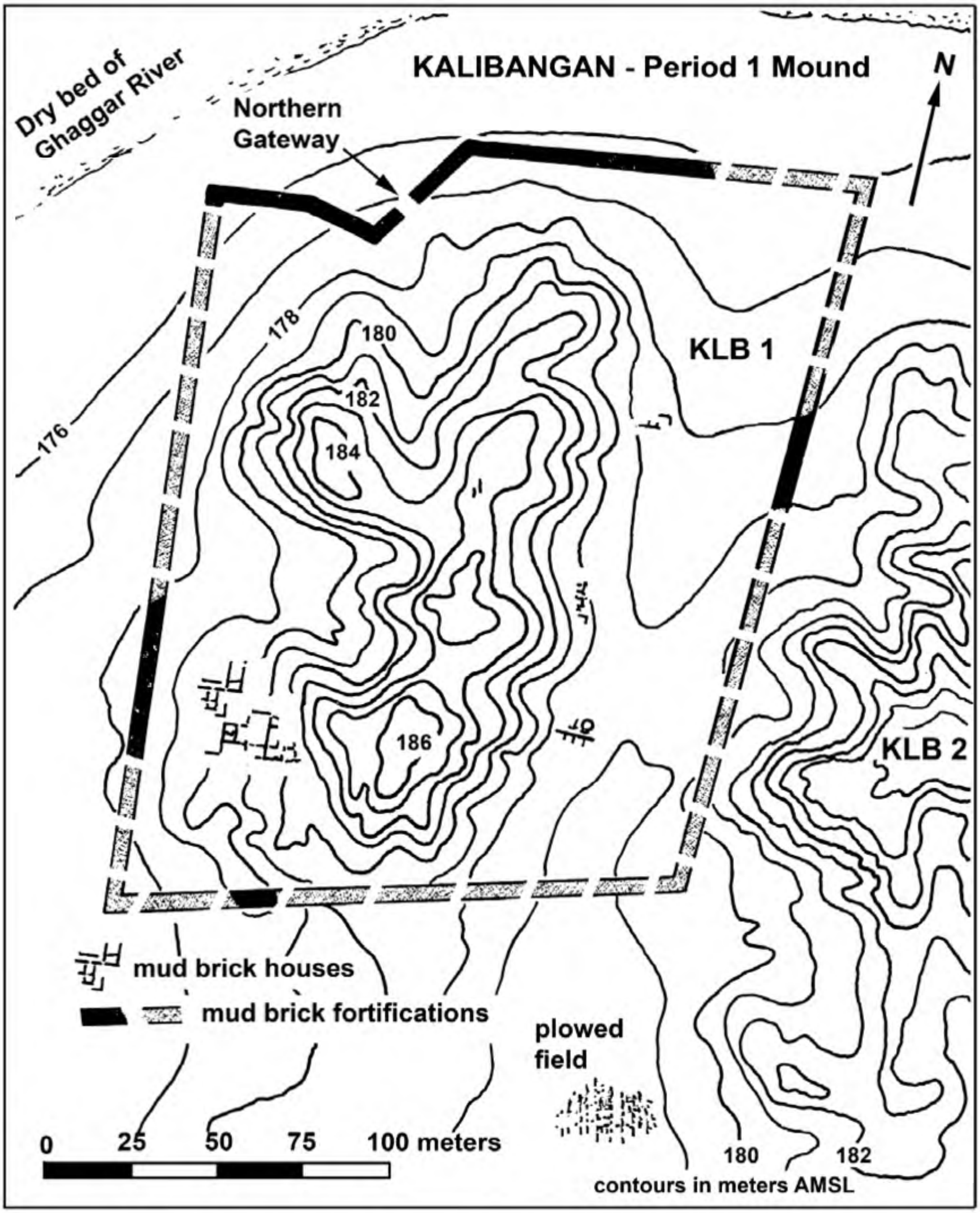


Fig. 8. Kalibangan, Early Harappan site plan (redrawn after Lal et. al. 2003).

specialized and involved in long-distance trade, and others may have been involved in local subsistence or service activities.

There are not many other sites that have the types of data needed for comparison with Harappa, but published reports do allow for some comparative discussion. The site of Kalibangan, located at the confluence of the Saraswati and Drishadvati

Rivers, is not very far from Harappa and provides a good comparative example for understanding the nature of Early Harappan settlements and households (Lal 1979; Lal et al. 2003). The Period I occupation extends over 4.5 ha and appears to have been enclosed in a massive mud-brick wall from the very beginning of the settlement (fig. 8). The wall bricks measure 10 × 20 × 30 cm (ratio 1:2:3), which is roughly similar to those found at Harappa during both the Ravi and Kot Diji phases. The wall around the settlement was laid out along the cardinal directions and was 1.9 m thick at the beginning of construction but over time was widened to as much as 4 m in some areas. A single gateway was discovered at the northwest corner, but there may be other gateways buried in unexcavated areas of the site.

The mud-brick houses in some areas were oriented to the cardinal directions, but one group of structures situated on either side of a lane are oriented to the northwest and southeast. House walls were made with smaller bricks (1:2:4 ratio) but the absolute size was not standardized. Rectangular rooms of different sizes and shapes were arranged around an open courtyard in one area of the site, but no complete structures or complexes were excavated due to overlying structures of the later Harappan Period. Houses had various types of hearths, including above-ground "ovens" (tandoors) and hearths or ovens that were sunk into the floor. Grinding stones and pestles as well as a range of chipped-stone tools and broken pottery are also associated with the houses. There is no report of craft indicators in the preliminary reports, but it is not unlikely that a wide variety of crafts were being practiced at the site. Brick-lined drains have been reported associated with Period I structures, but it is not clear if they are linked to bathing floors or simply built in the lanes.

The site of Kot Diji, which is in fact the type-site for this Early Harappan Period, has revealed numerous fragmentary house structures dating to around 2800 B.C.E. but, again, no complete building plans (F. A. Khan 1965). The houses at Kot Diji were constructed of stone rubble for the foundation courses and had mud-brick superstructures. Many rooms had hearths and storage vessels, and some open areas may have been used as courtyards or passageways. There is no evidence for wide streets or uniform orientation of the houses during this period at Kot Diji, but in the subsequent Harappan Period wide streets and houses oriented to the cardinal directions become the norm.

Anther important site dating to this period is Rehmandheri, which has three periods of occupation, all dating to the period between 3300 and 1900 B.C.E. (Durrani 1988). Periods I (ca. 3340–2850 B.C.E.) and 2 (2850–2500 B.C.E.) correspond roughly to the time of the Ravi and Kot Diji phases at Harappa. No complete house structures were exposed in the Rehmandheri excavations, but it was possible to define rectangular rooms with walls made from dressed clay blocks. Similar blocks of cracked clay are used today in the region, joined together with clay mortar. The rooms were used as domestic areas and had rectangular hearths made with half-baked clay, some of which had an opening on one side to add fuel. Other features include grinding stones and clay storage bins that may have been used as grain silos (Durrani 1988: 64). The settlement was surrounded by a perimeter wall, and the house walls and the settlement walls were oriented to the cardinal directions. No streets were noted in the earlier periods, but they can be identified by Period III. Based on the few sites with reported architectural features, it appears that there continued to be some regional variation in the organization of house forms and construction materials but, generally speaking, multiroom rectangular structures associated with open areas or courtyards become more common. Most settlements have evidence for perimeter walls that some scholars refer to as fortifications (Wheeler 1968), but so far there is no evidence for conflict during this period. Ash layers reported from the final Kot Diji levels at Gumla and Kot Diji were originally interpreted as representing destruction levels, but they could just as well reflect localized dumping of ash and charcoal or isolated fires. The upper layers of Nausharo were clearly destroyed by fire and abandoned for some time, but the continuities in artifact traditions and household organization at Kot Diji and Nausharo indicate that the same or similar communities probably continued to live at the site. The main difference between the Early Harappan and Harappan phases at these two sites is seen in the introduction of streets and drains and the organization of houses in blocks or neighborhoods. At Harappa and Kalibangan, the Early Harappan houses were already oriented along streets and had drains, and the transition between the Early Harappan and later Harappan phase does not show any major discontinuity in architectural traditions.

The distinctive material culture associated with the early Kot Diji-phase households at Harappa and other sites is seen in the styles of wheel-thrown pottery and relatively simple painted designs. However, toward the end of the Kot Diji phase, elaborate floral and geometric painted designs using black paint on red slip begin to appear. Some of these were also painted with polychrome decorations. At Harappa, evidence for control or ownership is seen in the use of potters marks and graffiti on pottery, a cubical stone weight, as well as the use of seals and sealings (Kenoyer 2000; Kenoyer and Meadow 1999). Some of the seals have geometric motifs, and one unfinished seal has an elephant motif that may indicate a clan or ritual symbol. The terracotta sealing found at Harappa has Early Indus script, and many of the postfiring graffiti can be defined as Early Indus script. All of these indicators suggest that some households at Harappa were developing stronger economic positions that were reinforced through the use of seals, weights, and writing. The construction of a wall around the settlement also indicates a new development intended to control access into or out of a settlement. People living in these Early Harappan communities were less "free" to build wherever they wanted or however they wanted due to the limited area enclosed within the massive mud-brick walls. These new developments in site organization and specialized craft activities during the Kot Diji phase can be related to the emergence of a more highly differentiated society. In particular, the use and elaboration of writing, seals, and standardized weights implies the development of an increasingly complex socioeconomic organization that would have required these means of communication and administration

The Kot Diji occupation at Harappa was contemporaneous with Mehrgarh Period VII and Nausharo Period I. In fact, some of the pottery found at Harappa during this period may have been brought to the site from Baluchistan and possibly even the area around Mehrgarh/Nausharo. The important difference between the two sites is that there already seems to be significant city planning at Harappa (and Kalibangan) during the Kot Diji phase, while at Nausharo this does not appear until the Harappan Period. Houses were oriented toward the cardinal directions and along wide streets and lanes that had some rudimentary drainage. Some courtyards and rooms associated with domestic areas have accumulations of craft debris that may reflect the continued practice of household-based specialized crafts. The patterns seen at Harappa and Kalibangan during the Early Harappan establish the basic form of urban structure that becomes widespread during the following Harappan Period.

Harappan Settlements—
Households and Neighborhoods

During the Integration Era, Harappa Phase (2600–1900 B.C.E.), more than 1500 settlements of the Indus civilization spread over a vast area encompassing more than 680,0000 square km (Kenoyer 1991). Needless to say, there are many different types of settlements and house structures that reflect the diverse communities living in different geographical regions and practicing different subsistence strategies. Due to limited space, it is not possible to discuss the evidence from the Harappa phase fully, but a brief overview is necessary to provide a comparison with the earlier periods.

The most common organization of domestic structures in both urban and rural contexts is multiroom brick, mud-brick, or stone foundation buildings with a central courtyard area. Some scholars have argued that the structures at Mohenjo-daro show a standardization of five different house types (Sarcina 1978–79), but in fact there is considerable variation due to multiple rebuilding phases that are still being analyzed (Jansen 1994). At Mohenjo-daro, fired brick was the most common building material (Mackay 1938; Marshall 1931), while at Harappa houses were made of fired brick and mud brick, with some wooden pillars (Kenoyer 2008; Vats 1940). At Dholavira and sites in Kutch, houses were made with stone rubble or dressed-stone foundations and mud-brick superstructures. In all of these sites, private houses usually had multiple rooms oriented toward a central space with indirect access into the home from a street or lane (fig. 9). The entryway was usually built with a curtain wall that would block the view of the interior of the house from passersby on the street. Houses were organized into blocks that were divided from each other by north–south and east–west streets or lanes. At Mohenjo-daro and Harappa, almost every house had a bathing platform with a drain leading out into the street, emptying into a sump pot or a brick-lined drain. Though earlier excavations at these large sites did not record hearths and ovens very carefully, the recent excavations at Harappa have shown that all houses had multiple cooking areas in one or more rooms. In many of the houses at Harappa, the cooking area was located in the northeastern corner (fig. 10; Kenoyer 1993), which is a pattern that was also noted at the site of Nausharo (discussed previously). One other important feature of urban structures that was overlooked in the earlier excavations is the location of latrines. The recent work at Harappa has shown that most houses had a separate area with sump pots used as commodes and a small drain that led to another sump pot in the street. These latrines were usually next to the bathing area, and both of these specialized rooms were situated adjacent to the street to allow drainage directly into the street. In smaller settlements during the earlier periods, people may have walked out into the fields to do their business as is common in many towns and villages in South Asia today. The Harappan cities show the first systematic use of latrines in almost every house block.

While craft activities continue to be associated with domestic structures during the Harappa phase, certain sectors of the city appear to be devoted to specific sets of crafts, and not all neighborhoods had craft workshops located in them (Kenoyer and Miller 2007). Some craft areas were located just inside the major gateways, which

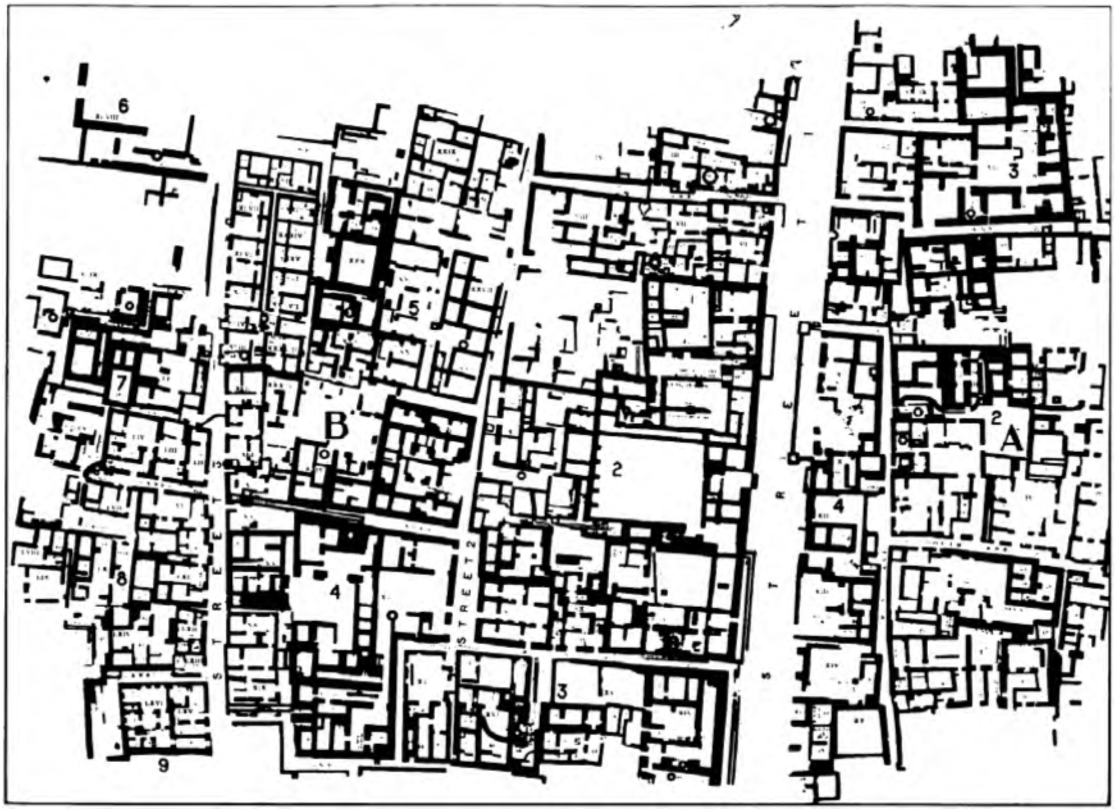


Fig. 9. Mohenjo-daro, HR Area houses and streets (from Jansen 1994 after Marshall 1931: vol. 3, plan 39).

made them easily accessible, while others have been found in the center of the settlement. At the northwest corner of Mound E, pottery-making continued to be the dominant craft beginning in the late Ravi phase and continuing on through the Harappan Period. This type of segregation of some crafts and the long term continuity of a craft in one area of the site was also seen at Nausharo between Period II and Period III. Many of the kilns found at Harappa were located on the southern or western side of the settlement, which may be due to the prevailing winds and also to the access to dumping areas at the edge of the city. As noted above, the practicality of this type of segregation was first implemented in the early pottery kilns of Mehrgarh and also at Nausharo and continues to be utilized even today in the location of pottery kilns near modern towns.

Conclusion

While it is always easier to focus on one period and look at the details, it is also useful to look at the long-term patterns of households and settlement organization. In this brief overview, I have tried to summarize the most important patterns that reflect changes and some continuities in household and neighborhood organization in the Indus Tradition. Through the comparison of what has been found at Mehrgarh/Nausharo and Harappa, as well as other regional sites, it is possible to make some

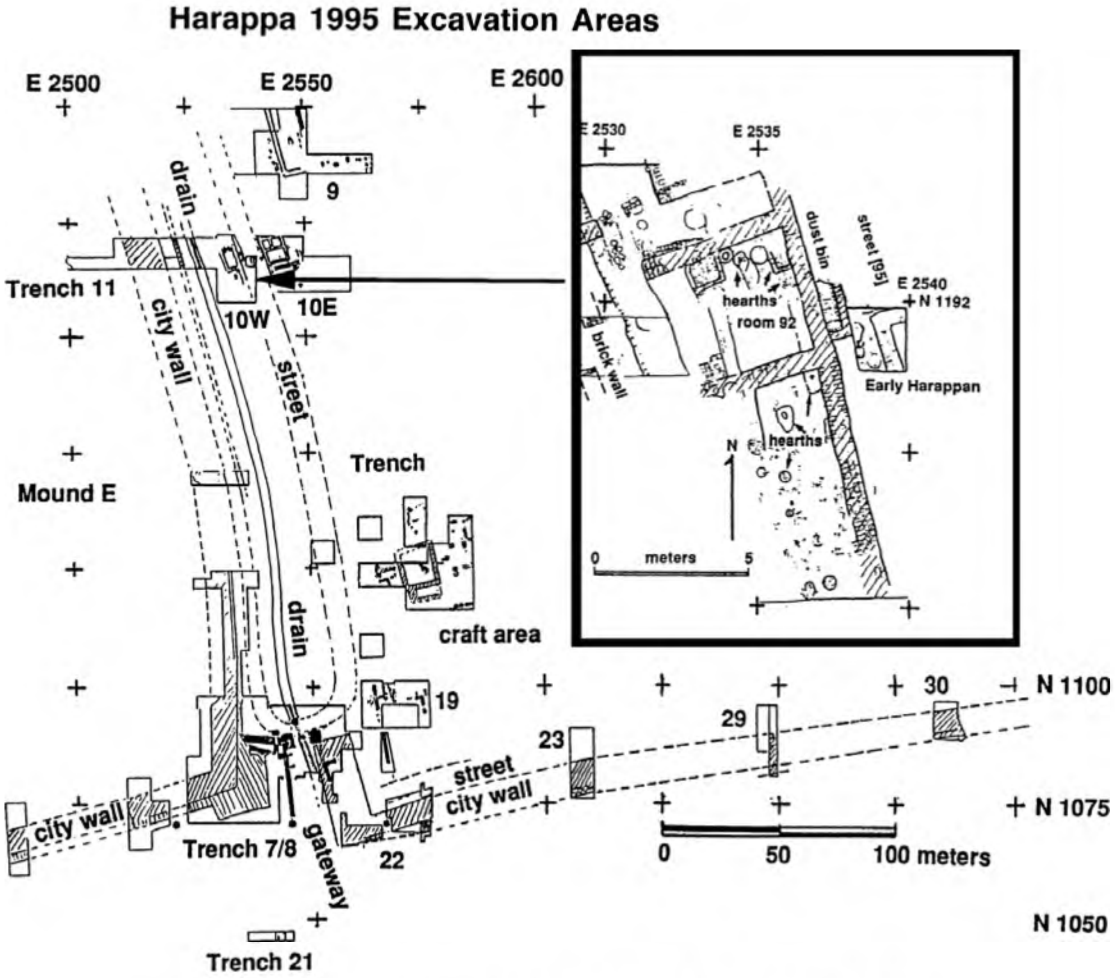


Fig. 10. Harappa, Mound E/ET, gateway, and habitation areas.

general observations about the development of households and neighborhoods in the Indus–Saraswati region as a whole. The use of compartmented storage facilities appears to have been the focus of household activity during the initial period of settling down (Mehrgarh) that continues into the early period of regional cultural development (Mehrgarh, Amri, Balakot). During the regionalization era in the core areas of the northern and northeastern Indus–Saraswati plain, evidence from sites such as Harappa, Girawad, and Kunal reveal distinct regional patterns that probably represent different cultural traditions. Living in a hut or a mud-brick structure at Harappa is clearly a different adaptive strategy than living in a semisubterranean pit house at Kunal or Girawad. Both of these latter sites also eventually adopted the construction of mud-brick houses, so the pit-house tradition was not very long lasting. The appearance of multiroom houses at Mehrgarh and later Nausharo can be compared with the multiroom houses at Harappa and Kalibangan and may reflect shared cultural attitudes or connections between the regions. Since the major trade networks for bringing goods to Harappa during the Ravi and Kot Diji phases lie to the north, we can also expect that there will be similarities with sites such as Gumla, Rehmandheri, and Sarai Khola.

Sites such as Harappa and Kalibangan as well as Rehmandheri and Kot Diji show evidence for perimeter walls or revetments around the edges of the settlements during the Kot Diji phase. The construction of walls is a pattern that is found in many areas of the world and is usually associated with protection or fortification. However, walls have many other functions that are equally important (Kenoyer 1993). At Harappa during the Harappan Period, they were clearly being used to control access into and out of different parts of the city. Walls and gateways allow the ruling elites within a settlement to limit who comes into the settlements for economic, political, or ideological reasons. This may have been one of the more important reasons for building perimeter walls, rather than simply for defensive purposes. Goods produced outside a settlement could be taxed as they were brought inside, and goods produced within the walled settlement could be taxed if they were taken out for redistribution to other communities. Walls also serve to stabilize a mounded settlement as it grows and rises up above the plain. In alluvial plains, settlements that are high above the plain are less likely to be flooded during the monsoon or spring melt. All of these factors contributed to the development of walled cities and towns.

It is only at Harappa and Kalibangan that we also see evidence for the organization of settlements into neighborhoods divided by streets and lanes. The combination of these two features—perimeter walls and streets—may be something that first emerges on the alluvial plain rather than in the piedmont or highland zones. The internal division and organization of a settlement can be the result of ideological concepts of cosmic structure and social relations or simply practical features of sunlight, shadow, or prevalent wind patterns. Structures at the site of Harappa show clear evidence of orientation along the cardinal directions beginning in the Ravi phase. Houses during the subsequent Kot Diji and then the later Harappa phases continue to maintain this same cardinal orientation. In contrast, sites such as Mehrgarh, Amri, and Nausharo, do not have consistent building orientations. By Period I at Nausharo, although many of the houses are roughly oriented to the cardinal directions, this pattern does not seem to be maintained for each of the structural walls.

Orientation along the cardinal directions does not however translate into streets and lanes without an additional variable. Streets and lanes are functional as access routes to allow inhabitants easy movement within a settlement. The only reason to make streets wide is to allow wide vehicular traffic, such as ox-carts, to enter and move throughout the settlement. At Harappa, the earliest possible toy terracotta cart fragment has been recovered from the Ravi phase (Kenoyer 2004, 2009), and toy terracotta wheels have been reported from early deposits at Girawad (Shinde et al. 2008). Toy terracotta carts and wheels become quite common during the subsequent Kot Dijian phase at sites throughout the Indus valley and, therefore, it is not surprising that Harappa and Kalibangan laid out their settlements with north–south and east–west streets.

In most ancient settlements in West Asia, there is little evidence for overall settlement planning. Neighborhoods grew up organically along major streets that connected gateways to temples or important households (Postgate 1992). In contrast, the Kot Diji-phase settlements of the Indus region show clear evidence of extensive centralized planning. Settlements were often rectangular in overall plan and surrounded by massive city walls that had two or more gateways (Durrani 1988; Lal 1979). The streets and lanes within the settlement were oriented along the cardinal directions and divided the city into relatively equal-sized housing blocks or neighborhoods (J.-F. Jarrige 1993b). The streets also were equipped with drains that emptied out of houses and neighborhoods. This pattern of equal access to all parts of a settlement and equal drainage for all houses and neighborhoods is something that was new and unique to the Indus region. It continued to be utilized as a basic pattern for urban organization throughout the subsequent Harappa phase as well as in later periods (Kenoyer 2008).

During the Harappa phase, we have clear evidence for well-maintained city walls and gateways and the establishment of major north–south and east–west streets leading from the major gateways. This system of street access was supplemented by smaller lanes, which would have allowed single ox-carts or foot traffic, thereby providing a uniform system of access to all neighborhoods. The closely spaced houses in the neighborhoods would have created shadows during most of the day, resulting in shaded streets that would have kept the city cool during the hot summer.

The last important feature to discuss is the drainage system that was built to allow waste water and sewage to exit bathing platforms and latrines. This waste accumulated in sump pits outside the houses in lanes and streets, which must have been quite smelly, especially during the hot summer. Maintenance of these sump pots would have required manual collection and dumping it outside the city. It is not unlikely that this was done by specific service communities rather than by each household or neighborhood. Drains for waste-water ran from houses into larger sewers and eventually out the major gateways or possibly over the wall, as at Nausharo. At sites such as Dholavira, there is also evidence for a separate set of catchment drains that collected rainwater and directed this resource to specially constructed storage tanks (Bisht 2000, 2005).

The important developments in household and neighborhood organization that correspond specifically with the emergence of towns and eventually cities appear to be directly relevant to conflict-avoidance or prevention and the establishment of a hierarchical but integrated community. Multiroom structures around a courtyard provided privacy in the increasingly congested and diverse settlements. Wells provided access to water at the household and community level. Water is an essential commodity that is often the source of conflict in ethnically and socially diverse communities. Bathing areas and latrines are also essential facilities that are needed in large settlements that do not have access to fields or rivers. The development of drains would have been necessary for the disposal of waste water and sewage and thereby avoid potential conflict at both the individual and the community level. Streets and lanes provided necessary access to all sectors of the site, linking households to neighborhoods and to the rest of the city. Finally, the construction of city walls and gateways provided a mechanism to include as citizens only those individuals or communities who were willing to support the urban system and conform to the social, political, and ideological norms. This last aspect is something that was being contested at different periods and in different ways, but it is a topic that will need to be explored in a future paper.

In closing, it is important to stress that more research is clearly needed at settlements dating to the Kot Diji phase and the initial Harappan urban period. We have very limited data for this crucial, transitional period. Additional studies also need to be carried out in the southern Indus Valley and Gujarat to determine if similar patterns of development can be traced for sites such as Mohenjo-daro and Dholavira. As new information becomes available, many of the interpretation presented here will need to be refined or even revised, and this is the only way to begin to connect the long history of this important region.

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Illustrations

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Changing Households at the Rise of Urbanism:

The EB I–II Transition at Tel Bet Yerah

Sarit Paz

Introduction

The EB I–II transition (ca. 3100/3050 B.C.E.) has long been considered pivotal to the introduction of urbanism in the Southern Levant. The nature of both the transition and the resulting urbanism are subjects of lively debates (e.g., Chesson 2003; Chesson and Philip 2003; Esse 1991; Greenberg 2002; Harrison 2001; Joffe 1993; Philip 2001). While accepting current reconstructions of EB II urban life as grounded in a heterarchical mode of social cohesion, I argue in this chapter (contra Philip 2003) that this form of organization was not a direct extension of earlier, village-based lifestyles but a novel introduction (see Yoffee 2005). This raises broader questions about the nature and origin of urban life in the Southern Levant.[1] Tel Bet Yerah in northern Israel is a good place to approach these issues, because it presents a continuous sequence throughout the Early Bronze Age. A new analysis of architectural sequences at Tel Bet Yerah, conducted as part of my research on the emergence of an urban *habitus* in the Southern Levant, reveals significant changes in the plan and character of houses and site layout during the transition from EB I to EB II. I believe that these changes are related to the beginning of urbanization and attest to the processes shaping this urban walled community, which involved negotiation between people regarding ways of life, ideas, and their application. These changes serve as a point of departure for this chapter, which attempts to reengage the issues of urbanization as a process and urbanism as a phenomenon and way of life, through a study of houses and households, using concepts borrowed from the theory

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[1] Early urbanism in the Southern Levant is substantially different from Mesopotamian urbanism in its degree of development, power sources, and political organization (Joffe 1993: 60–65). For this reason, cities do not necessarily imply the existence of state organization (Joffe 1993: 60–61). In past decades, scholars assumed a direct connection between Mesopotamian urbanization and the urbanization in the Southern Levant (Kempinski 1978; Portugali and Gophna 1993). Although urban concepts that appear in the Southern Levant at the beginning of EB II show some affinities to Mesopotamian urbanism, there is no evidence for direct relations with Mesopotamia at this time (Greenberg 2011). Therefore, Southern Levantine urbanism should not be considered as simply a down-scaled version of Mesopotamian urbanism but rather as a local development in which some ideas are adopted and translated in order to fit the local conditions and needs (Joffe 1993: 65; Greenberg 2011).

Table 1

Tel Bet Yerah Period	*Chronological Period*	*Dates*
A	EB IA	3650/3500–3350 B.C.E.
B	EB IB	3350–3100/3050 B.C.E.
C	EB II	3100/3050–2850 B.C.E.
D	EB III	2850–2500 B.C.E.
E	Final EB (not EB IV)	2400–2400 B.C.E.

of agency, the concept of *habitus* (Bourdieu 1977), and the model of house societies (Lévi-Strauss 1982).

The discussion is based on the recognition that houses are architectural units that represent the spatial loci of social relations and that households are recursive social units where personal and group identities and interests interact and may influence and shape the course of broader sociopolitical processes in the community (e.g., Blanton 1994: 5; Bourdieu 1973, 1977; de Certeau 1984; Giddens 1984; Netting et al. 1984; Pader 1993; Roseberry 1988; M. E. Smith 1987; Wilk and Rathje 1982). Houses and their contents comprise an entirety of material culture that reflects decisions regarding homemaking and the creation of personal and group space and identity, using both material and nonmaterial resources (Chesson 2007). While studying individual houses as discrete units is valuable, they should also be examined in comparison to other houses and in relation to other elements in the built environment, in both diachronic and synchronic perspectives.

The aim of this essay is to gain new insights regarding the EB I–II transition and the process of urbanization in the Southern Levant, as seen in the study of houses and households at Tel Bet Yerah. For this purpose, I will present two case studies of houses from EB I and II at the site. In each case, the material and spatial aspects of the house and the related material culture will be described and examined and a spatial and functional analysis of each house will be conducted. The houses will then be integrated in a contextual analysis at the site level and the relative positioning of houses and other components of the built environment will be examined. EB I and II houses and their place in site layout will be compared in order to trace the differences and changes in material culture and social organization.

Tel Bet Yerah was excavated by various expeditions between 1933–1995 (fig. 1; Greenberg and Paz 2006). The Tel Bet Yerah Project (TBYREP) headed by Raphael Greenberg renewed excavations at the site in 2003. For this essay, I used material from old excavations. Unfortunately, due to methodological and other constraints, there are only a few complete "household assemblages"—encompassing the categories of architecture, ceramics, tools, flora, fauna, etc.—from Early Bronze Age Bet Yerah as a whole. Architectural remains, however, were for the most part well-recorded, thus allowing analysis even when other information is incomplete.

The EB I at Tel Bet Yerah

Habitation at Bet Yerah began on the north half of the mound early in EB IA (TBY Period A, ca. 3650/3500–3350 B.C.E.; Table 1). Large quantities of pottery were

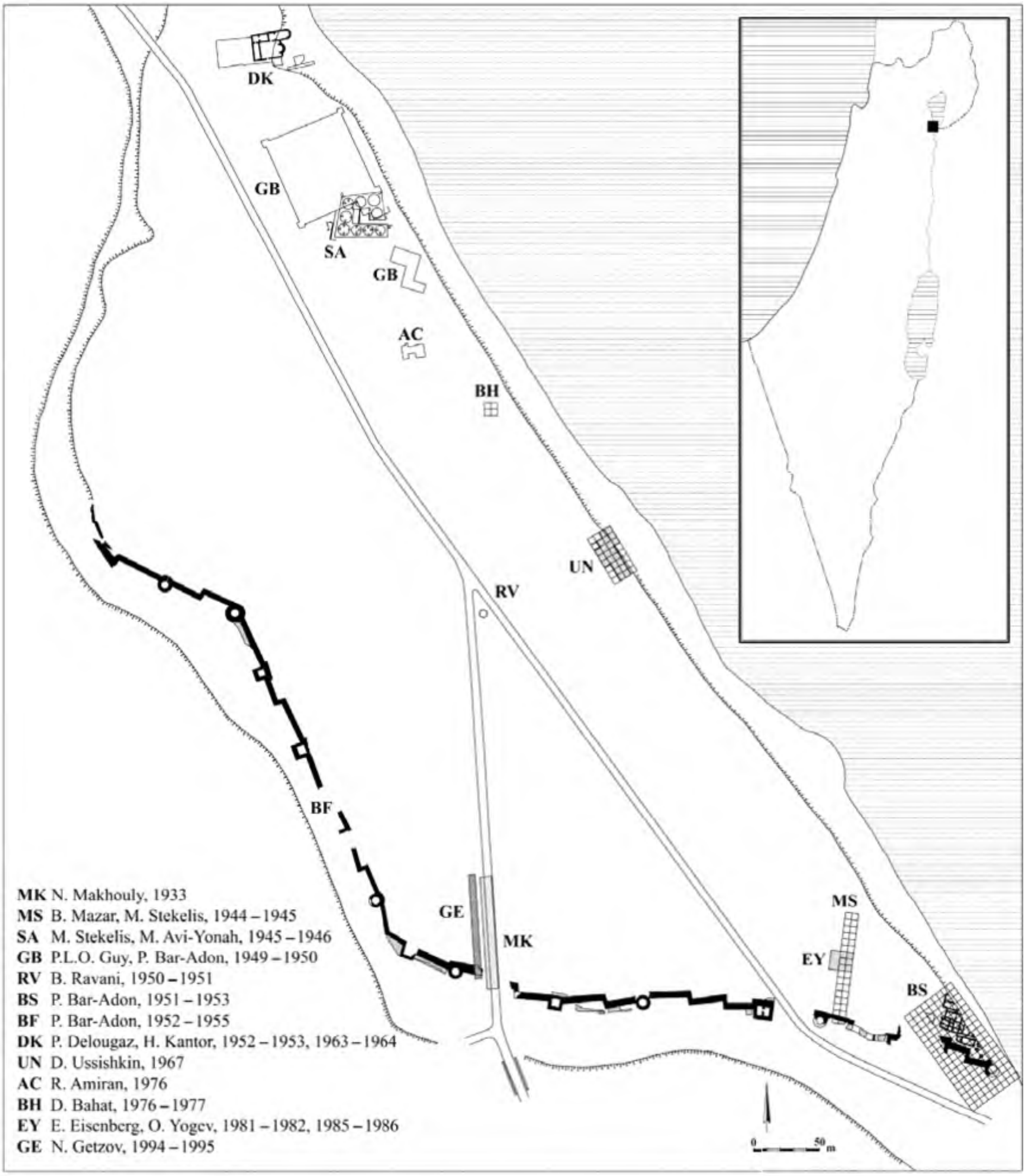
DK
GB
SA
GB
AC
BH
UN
RV
BF
GE
MK
MS
EY
BS
MK N. Makhouly, 1933
MS B. Mazar, M. Stekelis, 1944 – 1945
SA M. Stekelis, M. Avi-Yonah, 1945 – 1946
GB P.L.O. Guy, P. Bar-Adon, 1949 – 1950
RV B. Ravani, 1950 – 1951
BS P. Bar-Adon, 1951 – 1953
BF P. Bar-Adon, 1952 – 1955
DK P. Delougaz, H. Kantor, 1952 – 1953, 1963 – 1964
UN D. Ussishkin, 1967
AC R. Amiran, 1976
BH D. Bahat, 1976 – 1977
EY E. Eisenberg, O. Yogev, 1981 – 1982, 1985 – 1986
GE N. Getzov, 1994 – 1995
0
50 m

Fig. 1. Map of the excavation areas at Tel Bet Yerah (from Greenberg and Paz 2006: Plan 1.1).

found but little architectural evidence was identified by the early excavators: mud bricks and mud-brick fragments and several intramural subfloor infants' burials (Paz 2006b: 85–87, plan 3.8, fig. 3.35–38). The main features identified in this phase are midden-pits dug into the soft marl bedrock, suggesting a spread-out habitation on the mound, with large intervening common areas known also from contemporary sites. Pitting within or at the edges of the habitation area continues into EB IB (TBY Period B, ca. 3350–3100/3050 B.C.E.) and disappears only later in the period.

In the beginning of EB IB (TBY Early Period B), pits and burials continue the occupational patterns of period A (e.g., Paz 2006b: 89, plan 3.8, fig. 3.40) but are spread across the entire mound. Some shallow pits were interpreted by the early excavators as house-pits (Maisler et al. 1952: 167). This cannot be substantiated, because excavation techniques were not sufficiently refined to identify post-holes or other signs of impermanent construction. The pits yielded mainly domestic refuse, with large quantities of ash (Eisenberg and Greenberg 2006: 343, plan 8.4; Greenberg and Eisenberg 2006: 120, plan 5.2, fig. 5.2; Paz 2006a: 19, 32–33, plans 2.5–6). The organic material included grains of wheat, peas, and olive pits.[2] Many fishing weights were found, mostly in open areas. Mud-brick fragments found both in the pits and the open areas testify to architecture in the vicinity, but few walls of this phase were identified (Eisenberg and Greenberg 2006: 343; Paz 2006a: 33).

Significant remains of domestic buildings were found in all parts of the mound in the next phase, Late Period. The finds indicate a gradual expansion of the settlement from north to south, with increasing density of architecture, gradual in-filling of open areas, and a decrease in the number of midden-pits within the settlement. Two architectural styles coexist at the site in this phase: rectilinear and curvilinear buildings. Rectilinear constructions of mud brick with no stone foundations were found in Areas BS (Greenberg and Eisenberg 2006: 121–22, plan 5.3; fig. 5.3), EY (Eisenberg and Greenberg 2006: 343–47, plan 8.5), GE (Getzov 2006: 12, fig. 2.11), AC (Amiran and Cohen 1976), possibly UN, and in the 2003 excavation at Area SA (fig. 1). The molded sun-dried mud bricks are uniform in shape and size and were typically arranged in courses composed of a row of full bricks and a row of half-bricks or bricks laid on their narrow edge. Mud plaster was used for bonding and coating the walls (Eisenberg and Greenberg 2006: 344; Greenberg and Eisenberg 2006: 121). Curvilinear construction were comprised of mud bricks on stone foundations, using bricks in various shapes, some trapezoid, to suit the shape of the building. Buildings of this sort were discovered in Areas BH and MK (Paz and Paz 2006: 470–71; 477–78, plans 9.2, 9.4, fig. 9.2–3, 9–10). The evidence points to a domestic function for these structures, although no specific activity areas could be discerned within them. Houses built in both styles appear to be organized as compounds. The curvilinear buildings are grouped around a shared open space, with a separate silo built nearby (Paz and Paz 2006: 477–78, plan 9.4).[3] The rectilinear buildings are organized as a broad-room, with adjacent courtyard and additional rooms (discussed below).

The general picture in Period B is, therefore, of a heterogeneous agglomeration of houses covering the entire surface of the 30 ha mound. There are no appreciable differences in chronology or material culture among the various Period B residences. House EY 475 is the best preserved, though only partially excavated, house of Period B (EB IB).[4]

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[2] The botanical remains were examined by Nilly Liphschitz.

[3] Round structures are found on occasion in late EB I contexts (e.g., Braun 1991; Epstein 1985; Golani 2003: 64; Wolff 2008: 1942–43), but some are interpreted as storage structures. The best parallel to the Bet Yerah curvilinear domestic structures is a large mud-brick building with stone foundations from Tell esh-Shuna, which is also said to be part of an agglomeration of similar structures in the center of the mound (Philip 2001: 178).

[4] The house belongs to Local Stratum 10 (Eisenberg and Greenberg 2006: plan 8.5).

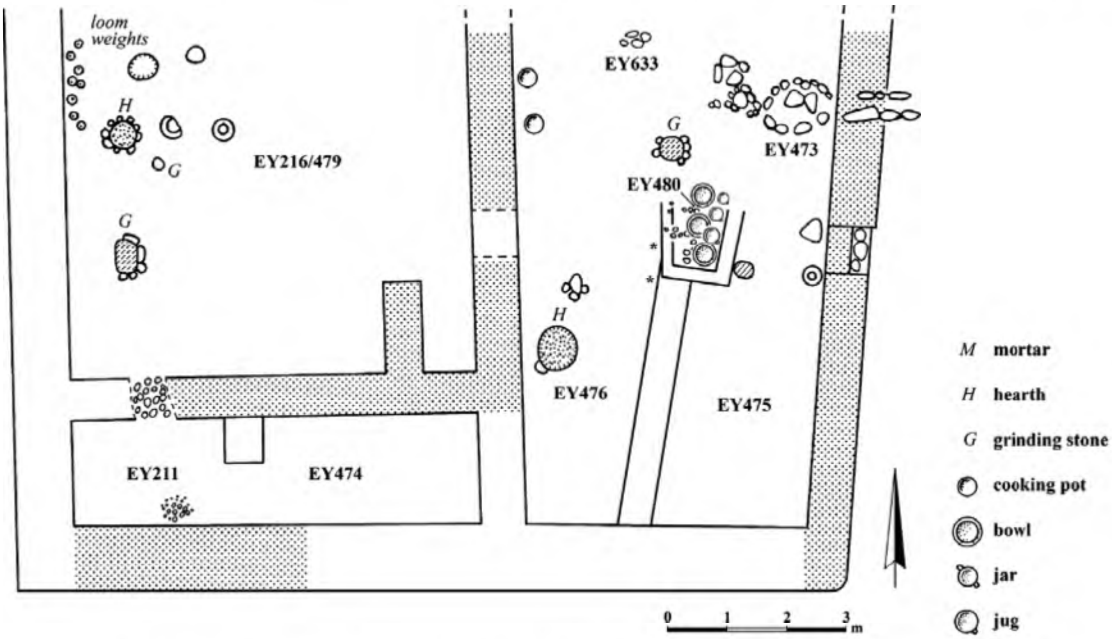

Fig. 2. Plan of Late Period B house EY 475 showing distribution of finds.

House EY 475

House EY 475 is a large structure that appears to consist of rooms ranged around an interior court (fig. 2). There was no sign of violent destruction, but a large number of portable finds discovered on the floors suggest sudden abandonment and little later disturbance, so that their distribution can give some idea of activity areas and function of spaces.

In the east, a large broad-room was entered through a doorway in the eastern wall, which is marked by a door socket (Eisenberg and Greenberg 2006: fig. 8.3, 8.5). The room is subdivided into several chambers. Left of the entrance, space EY 475 yielded a number of flint blades and a bone point. This more private space could have served as sleeping quarters. To the right of the entrance, EY 473 was approached directly. This space contained fragments of various storage and table vessels (Eisenberg and Greenberg 2006: fig. 8.47:2, 3, 9, 12, 13; 8.48:5), a bone spatula, and plant remains such as wood charcoal, olive pits, grape pips, and wheat grains.[5] A stone drain led from a water-related installation toward the external courtyard. The northwest part of the room, EY 633, contained two cooking pots (fig. 3.8–9) placed near the wall, a stone bowl, a miniature stone mortar, and some flint artifacts. A group of storage and table vessels was found in storage bin EY 480 (fig. 3.1–7; Eisenberg and Greenberg 2006: fig. 8.5),[6] as well as flint blades and a ceramic pendant. The finds

[5] The botanical remains were examined by Nilly Liphschitz.

[6] In the excavation report space EY 480 does not appear, and this space is simply seen as a continuation of EY 473 (Eisenberg and Greenberg 2006: plan 8.5). However, the installation originally assigned to Stratum 9 (Eisenberg and Greenberg 2006: 348–349, plan 8.6), may be interpreted as a Stratum 10 storage bin.

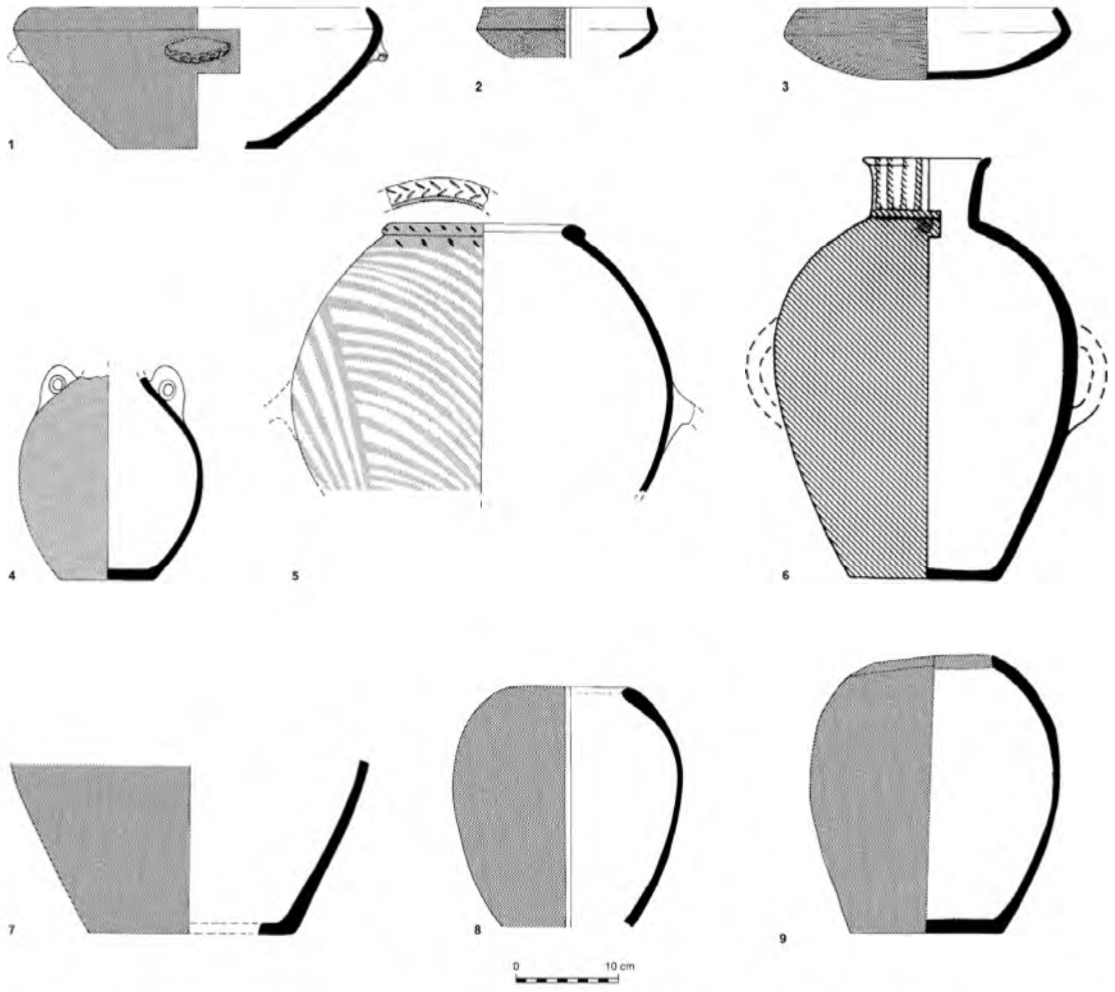

Fig. 3. Complete and almost-complete ceramic vessels from House EY 475: 1–7: vessels from storage bin EY 480; 8–9: cooking pots from space EY 633.

suggest that this area served for storage of food and vessels and food preparation (processing rather than cooking). Space EY 476, separated from the main room by a dividing wall and approached from the "kitchen" area, had a hearth and a possible stone work-table. It yielded only a lamp, small bowl, copper axe fragment, and a small basalt object of unknown function.

A doorway leads from the main broad-room west to a large space, EY 216, which was possibly entered from its southwestern corner as well. In its southeast corner, there is a small cell. Installations include a small stone-lined hearth near the northwest corner, with two stone bowls or mortars to its east and a lower grinding stone found *in situ*, surrounded by small stones. A row of eight basalt whorls, possibly used as loom-weights, were found aligned along the western wall.[7] Other finds include a grooved fishing-weight, an additional basalt weight, and several flint blades. No restorable pottery was found. The data suggest that this large unroofed courtyard was a multipurpose space for activities such as food processing and cooking, as well as crafts and weaving. The smaller spaces to the south were an adjunct to the courtyard, and contained a few stone and lithic artifacts similar to those in the courtyard. In the open areas east and south of the house there was an irregularly shaped brick installation and some ash patches. Finds included discarded artifacts such as sherds of large storage and cooking vessels, as well as a work-table, fishing weights, and an animal figurine.

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[7] The whorls were originally attributed to EY 201 of Stratum 9A (Greenberg and Eisenberg 2006: 351), but judging by the elevations and their alignment along the courtyard wall, they were reassigned to the Stratum 10 courtyard.

The total excavated area of both roofed and unroofed spaces of house EY 475 is approximately 75 square m. The excavated roofed space in the house is about 45 square m. Assuming additional roofed space in another part of the compound, this could allow for the presence of six or seven persons and may suit a joint or partially extended family, with space for small livestock in the inner courtyard or in open areas near the house (Marfoe 1980: 319; Gadot and Yasur-Landau 2006: 591–92).[8]

Several conclusions can be reached regarding the division and spatial organization of the house and the tasks performed in it. The main entrance to the house was from the east. The location of the door-socket indicates that the door was opened southward, making space EY 475 hidden as one entered the house, thus implying a more private function. In contrast, the "kitchen" area was directly entered from the main door. Individuals performing their daily tasks there had a direct view to the main entrance, as well as the exit to the courtyard. It seems plausible that cooking took place mostly in the unroofed courtyard. The hearth in EY 476 could have been used seasonally, on rainy days. Its location near the opening leading to the courtyard would have allowed the smoke to escape. Activities in the courtyard included food processing and preparation, weaving, and possibly fish-net preparation and repair. Weaving took place in the back, innermost location of the courtyard, at the point farthest from the entrance. Activities in the open areas near the house included possible storage, fish-net repairs, and possibly related tasks and garbage disposal.

The disposition of finds in the house brings to mind structuralist analyses such as Bourdieu's (1973) study of the Berber Kabyle house, which suggests that the location of the entrance and of different spaces and activity areas may be associated with gender and based on principles of oppositions. In general, Bourdieu considers the house to be women's domain, while men work most of the day outside; however, various elements in the house itself may be considered to be male or female, thus having implications for gender relations in the house. In Bourdieu's case-study, the main door to the east is considered male, while a smaller one, opposite, is female, and the woman's loom is placed against the west wall in the innermost part of the dwelling. This may recall the EB I house presented here. However, Bourdieu (1977: 90) himself was critical of his own formal structuralism with regard to the Kabyle house and tried to see the artifacts and objects as a materialization of the *habitus*, that is, of the movements of people and of their relationships in space. This view of the house as a "structuring structure" is in line with the suggestion that structuring principles of organization and order should also be examined in terms of accessibility and exclusion (Mitchell 1988: 50–56; Parker Pearson and Richards 1994: 19–20), because they both deal with the way space is used or the way the physical embodies ideas about social/gender relations.

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[8] Marfoe (1980) analyzes the dwellings of the EB II town of Arad and suggests an index of 6 square m of roofed area per person, close to Kramer's (1979) observation of roofed 7 square m. In this case, the 10 square m per individual suggested by Naroll (1962) may be applied to the total area of both roofed and unroofed spaces of the house (Marfoe 1980: 319). The similar spatial arrangement of the EB II house compounds at Arad and the EB I compound EY 475 at Bet Yerah allows the use of the same assessment for the later.

Some household activities and spaces at Tel Bet Yerah house EY 475 may be engendered based on the spatial analysis of finds and insights gained from ethnographic sources. Two of the activities identified in the house are often associated with women: domestic food preparation (Gadot and Yasur-Landau 2006: 595; Meyers 2003: 431–32; Nelson 1997: 104–6; Singer-Avitz 1996: 171) and weaving (Meyers 2003: 433). Thus, the kitchen area and the unroofed courtyard may have been predominantly the loci of women's activities. However, this does not imply a gendered segregation (Meyers 2003: 428). In the courtyard, there was also evidence for the manufacture and repair of fish-nets, and although fishing itself might have been a male task, preparing fish-nets cannot be gendered as exclusively male or female.[9] It is therefore possible that males also performed some tasks in the courtyard. House EY 475 thus appears to indicate that the structuralist-inspired gender dichotomy of activities and spaces was not entirely rigorous (see for example Gadot and Yasur-Landau 2006: 595–596; Sørensen 2000: 147–48). The issues of control of access to different parts of the compound from the busy female activity area of the kitchen, and the limited access to the private quarter hidden behind the door, are also noteworthy. Working in the kitchen area allowed supervision of the main entrance to the house, which separated between the public open area east of the house and the private spaces of the house.

House EY 475 represents the typical configuration of Late Period B houses at Bet Yerah. Though houses of this period were built in different forms and using different construction techniques, they were all arranged as compounds surrounded by open areas. The compound included several roofed spaces and an open courtyard in which various activities took place. The distribution of finds allows the identification of specific activity areas for food preparation, cooking, storage, weaving, and fish-net manufacture and repair. Open spaces near the house also served for some household activities such as storage, fish-nets repairs, and possibly related tasks, and for garbage disposal. This picture changes gradually in the transition to Period C.

The Early Period C Houses

A clear architectural break is evident throughout the site between Period B and Period C (EBII, ca. 3100/3050–2850 B.C.E.). The builders of the Period C settlement reestablished occupation as if on virgin soil. It appears that the baseline for the new site plan was the construction of the mud-brick city wall (Wall A), from which a grid of paved streets extended northward (Greenberg and Paz 2005; Paz and Greenberg 2006: 235–47; Greenberg and Eisenberg 2006: 124–25, plan 5.5, 5.5a). The street system was continuously developed and used throughout the EB II and EB III. Segments of several house-lined streets have been found in various parts of the mound (e.g.,

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[9] On the difficulty of engendering exclusive male activities and spaces, see Bird 1993; Gero 1991; Gadot and Yasur-Landau 2006: 595–96.

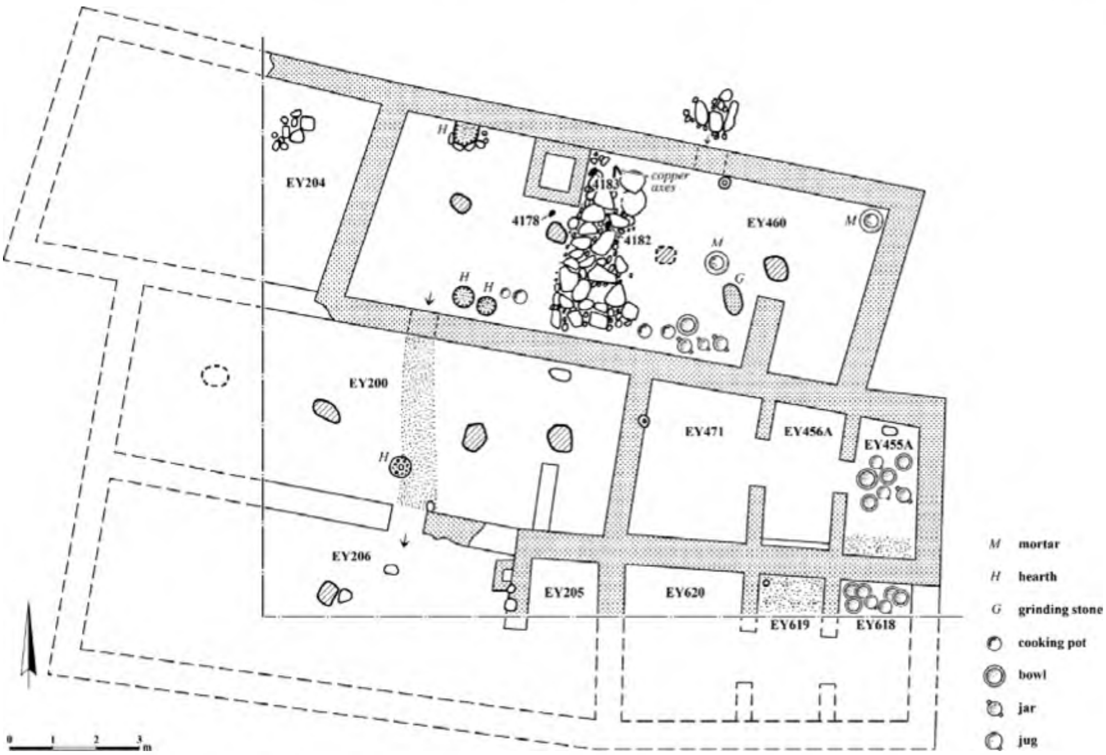

Fig. 4. Plan of Early Period C house EY 460 showing distribution of finds.

Paz 2006b: 69, plan 3.3; Paz and Paz 2006: 472, fig. 9.5; Eisenberg and Greenberg 2006: plan 8.9).

The houses near the city wall and gate (Area BS, Greenberg and Eisenberg 2006: plans 5.5, 5.5a) are characterized from the very beginning of Period C by a rectilinear construction aligned with the street system, which becomes the typical house plan throughout the site later in the period (see discussion below). However, they were only partly excavated, and the finds were poorly documented. Three structures in Area EY/MS are the best-preserved Early C domestic architecture at the site. In contrast to Area BS, the houses in this area are located at some distance from the main paved streets,[10] and the local sequence shows that they were only gradually incorporated in the grid. This can be seen in the layout changes, growing density of houses, and addition of alleys during the EB II (Eisenberg and Greenberg 2006: plans 8.8, 8.9). They therefore offer a good opportunity to observe the dialectic between urbanization (wall and grid) and household at the very beginning of the process.

House EY 460

The structures comprising this house compound were only partly excavated, and the western portion of all three lies outside the excavated area, as does most of the southern structure (fig. 4). All the finds are domestic in character. Construction

[10] Area EY is located ca. 200 m west of the city gate and the streets drawn from it at Area BS (fig. 1).

methods show only limited continuity with Period B: there is no curvilinear construction, and rectilinear walls are built on stone foundations, with the exception of minor interior walls. However, the brick-laying technique is the same used in the earlier phase, with walls built of alternating rows of full and half-bricks (Eisenberg and Greenberg 2006: 348). The house plans also demonstrate new trends in the arrangement and spatial organization of daily activities. Due to their almost identical architectural features, they were first interpreted by the excavators as three houses built together. However, the spatial distribution of finds indicates that the structures form a single compound, with specialized functions for its different parts.[11] The complex has two early Period C phases, marked by the continuous use of the buildings with only minor changes—the raising of floors and slight structural alterations (Eisenberg and Greenberg 2006: 348, plan 8.6, 8.7). I will present the earlier phase, Local Stratum 9A, which yielded considerable quantities of *in situ* finds on the floors, apparently the result of the collapse of the roof. Following the destruction, there was very little later disturbance, because the floors of Local Stratum 9B were established on top of the debris of the collapsed Stratum 9A roof. The distribution of finds can therefore give evidence of activity areas and function of spaces.

The main space of the northern unit, EY 460, is a pillared hall of the broad-room type, with a central area paved with stone slabs and almost no subdivision (Eisenberg and Greenberg 2006: fig. 8.7–8.10). A door-socket marks the doorway, approached by a patch of stone pavement just outside the door. The small chamber in the southeast corner yielded little evidence of its function. The ceramic assemblage consisted mainly of closed vessels—cooking pots and storage jars or jugs—of either local or imported wares (North Canaanite Metallic Ware)[12] that represent a dramatic break with Period B traditions. Several complete vessels, including a Metallic Ware pithos, a jar, and two large cooking pots (figs. 5–6), were found together near the back wall of the hall near the stone pavement (Eisenberg and Greenberg 2006: fig. 8.10), and were probably used for storage of liquids and dry goods. Near the vessels, there was a lower grinding stone and a large fixed mortar. Another mortar was set in the floor in the northeast corner of the hall (Paz 2006a: 33, plan 2.8). Several ground-stone implements were found on the pavement including an upper and a lower grinding stone, portable mortar, and pestle. Other finds included flint blades, tabular scraper, bone spatula, and two copper axes found together, intentionally stashed beneath the earthen floor near the stone pavement (Eisenberg and Greenberg 2006: fig. 8.11).

Hearths were identified west of the pavement, the largest marked by a circle of small burned stones, abutting the northern wall. The pottery from this area (EY 466) included mainly cooking pots (fig. 7). It seems that this hall served chiefly for food preparation, with the large jars and pots serving for temporary storage, the grinding stones and mortars for processing, and the hearths and smaller pots for cooking. The virtual absence of serving vessels suggests that the food was consumed elsewhere.

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[11] This possibility was raised by Greenberg and Eisenberg (2006: 357) following the Stratum 9 ceramic-assemblages analysis.

[12] North Canaanite Metallic Ware was produced near Mt. Hermon, about 50 km from Tel Bet Yerah. It is widespread in the northern part of the Southern Levant and comprises a major component in EB II ceramic assemblages at approximately 150 sites. It is characterized by the use of a single source of clay, consistent forms and manufacture technology, and high quality (Greenberg 2002, 2011; Greenberg and Porat 1996).

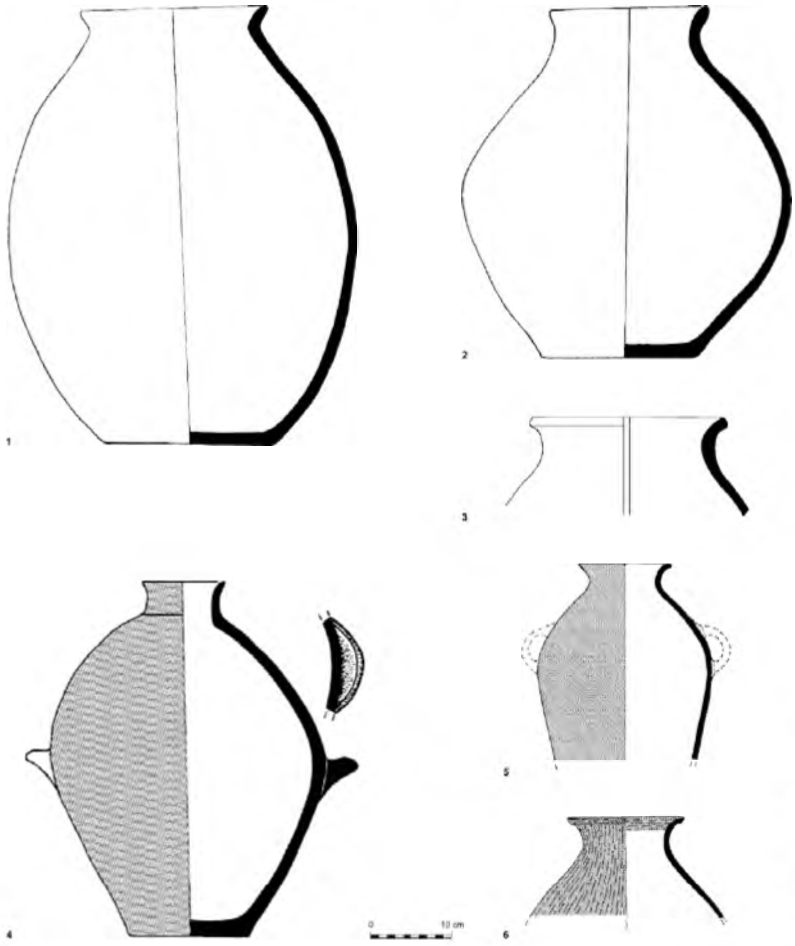
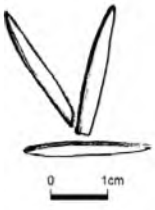


Fig. 5. Closed ceramic vessels found at the rear part of space EY 460 near the pavement: 1–3: large cooking pots; 4–6: storage jars.

EY 204 to the west contained few hints regarding function in its early phase, but its second phase yielded many finds, including a basalt potter's tournette and other implements related to ceramic production (Eisenberg and Greenberg 2006: 354).

South of EY 460, the excavators have identified a symmetrical double unit composed of a pillared broad-room attached end-to-end with a tripartite hall. The pillared hall EY 200 contained few diagnostic finds, a possible hearth, and a basalt worktable. A strip of packed gravel paving runs across the room, between its apparent entrances. The two western rooms of the tripartite hall contained few finds. The easternmost room (EY 455A), however, contained a rich assortment of mostly complete serving vessels, some fragmentary storage vessels, and stone processors (fig. 8: 1–8; see also Eisenberg and Greenberg 2006: fig. 8.56). In the third unit of the compound, of which only the northern part was excavated, most of the finds were also concentrated in the innermost room (EY 618) and consisted of complete small and large bowls, a mug and a jug (fig. 8: 9–16), and a few flint blades. The concentration of serving vessels in the rear and least accessible room of each tripartite unit is noteworthy.

In the open area east of the compound were several stone-lined hearths, stone and clay bins in the southeast corner, and a refuse pit (Eisenberg and Greenberg 2006: 352, plan 8.6). The finds included pottery fragments, a considerable number of



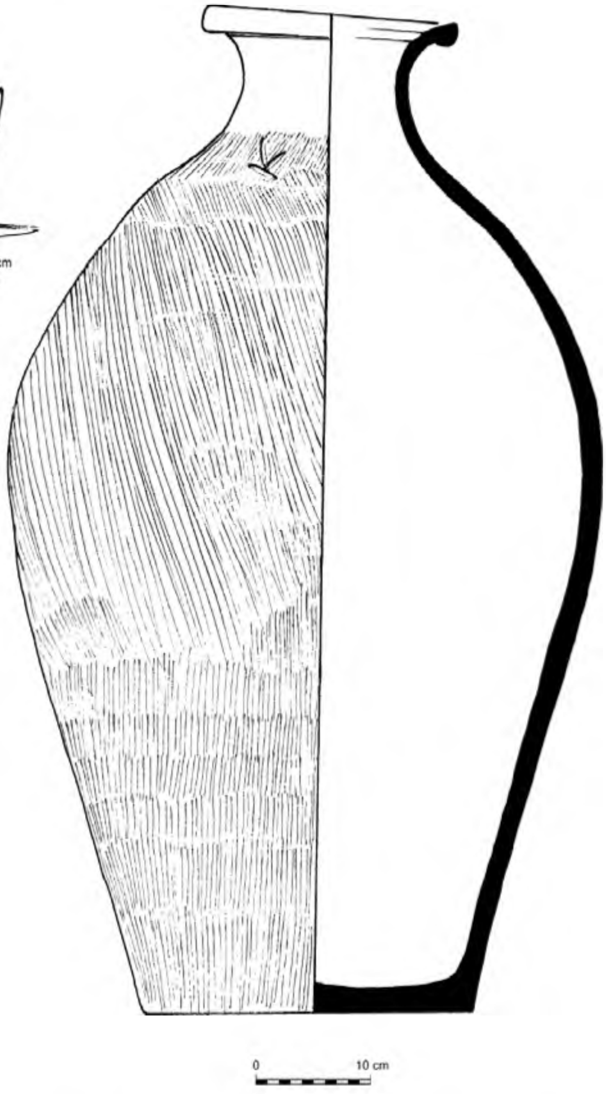


Fig. 6. North Canaanite Metallic Ware pithos found with the group of vessels in the rear part of space EY 460.

fishing weights, implying the use and possibly repair of fish-nets, some flint blades, and small stone artifacts. No grinding stones were found in this area.

It appears that the house of Early C in Area EY was a contiguous compound with segregated activities and a communal space outside, possibly surrounding the compound. This was to disappear in the later phases, as I will describe below. Although the architectural characteristics such as size and layout could suggest that each of the three structures was an independent unit, the spatial distribution of finds seems to indicate they all formed a single compound, with specialized functions for the various parts. The northern pillared hall EY 460 served for food preparation, with separate areas for short-term storage, food processing, and cooking; serving and eating took place elsewhere. Serving vessels were stored in the least-accessible innermost small rooms of the tripartite units, suggesting their use on occasions in the adjacent pillared halls south of EY 460. The open areas surrounding the house served mainly for fish-net maintenance and possibly other fishing-related activities, possible stor-

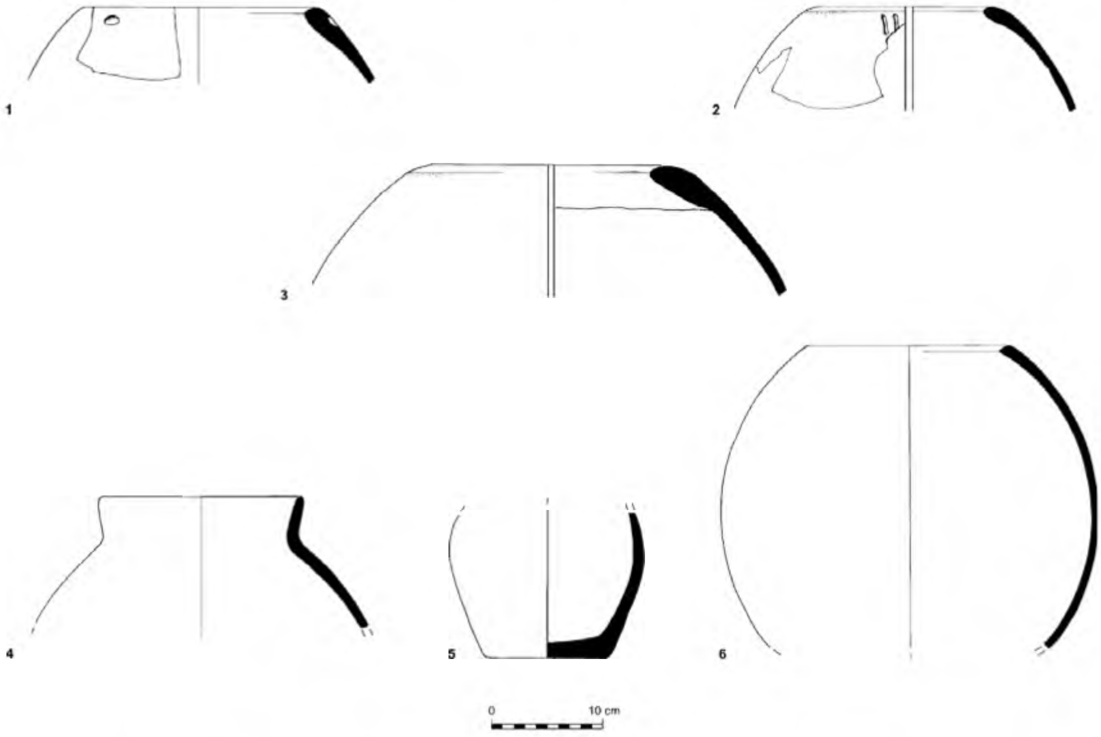


Fig. 7. Cooking pots found west of the stone pavement in space EY 460.

age, cooking, and garbage disposal. According to the suggested reconstruction of the compound plan, based on the close affinities of its three architectural units (fig. 4), the total area of house EY 460 may be estimated at 150 square m. This may have suited a joint or extended family of 12 to 15 persons (Marfoe 1980: 319).

The combination of unique architecture, which implies independent units, with the spatial organization that testify to use as a single complex, may suggest that this Early Period C house was in fact a compound on the way to becoming separate houses. The distribution of finds in the house's second phase of use (Local Stratum 9B, Eisenberg and Greenberg 2006: plan 8.7) indicates that some changes were made in the spatial organization of activities in the compound. While the small back rooms of the units continued to serve mainly for storage of various vessels, the broad-room halls became less segregated for food preparation and consumption.[13] Evidence of pottery production was found in this later phase in the space west of the main north hall (EY 196, Eisenberg and Greenberg 2006: 352). These changes imply possible changes in spatial and social relations at the house, with a more in-

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[13] In hall EY 450 (formerly 460) there were several hearths, and the ceramic finds (Eisenberg and Greenberg 2006: fig. 8.61) included various types of bowls and other serving vessels and cooking-pot fragments. In contrast to the previous phase, no storage vessels and stone processors were found. However, there were several flint and bone implements. The second hall (EY 197/458) was slightly changed, and also yielded both food preparation and presentation vessels (Eisenberg and Greenberg 2006: fig. 8.62–63). The small rooms of the tripartite units to the west seem to have continued to serve for storage mainly of presentation vessels and small storage jars (See EY 455B, Eisenberg and Greenberg 2006: fig. 8.64).

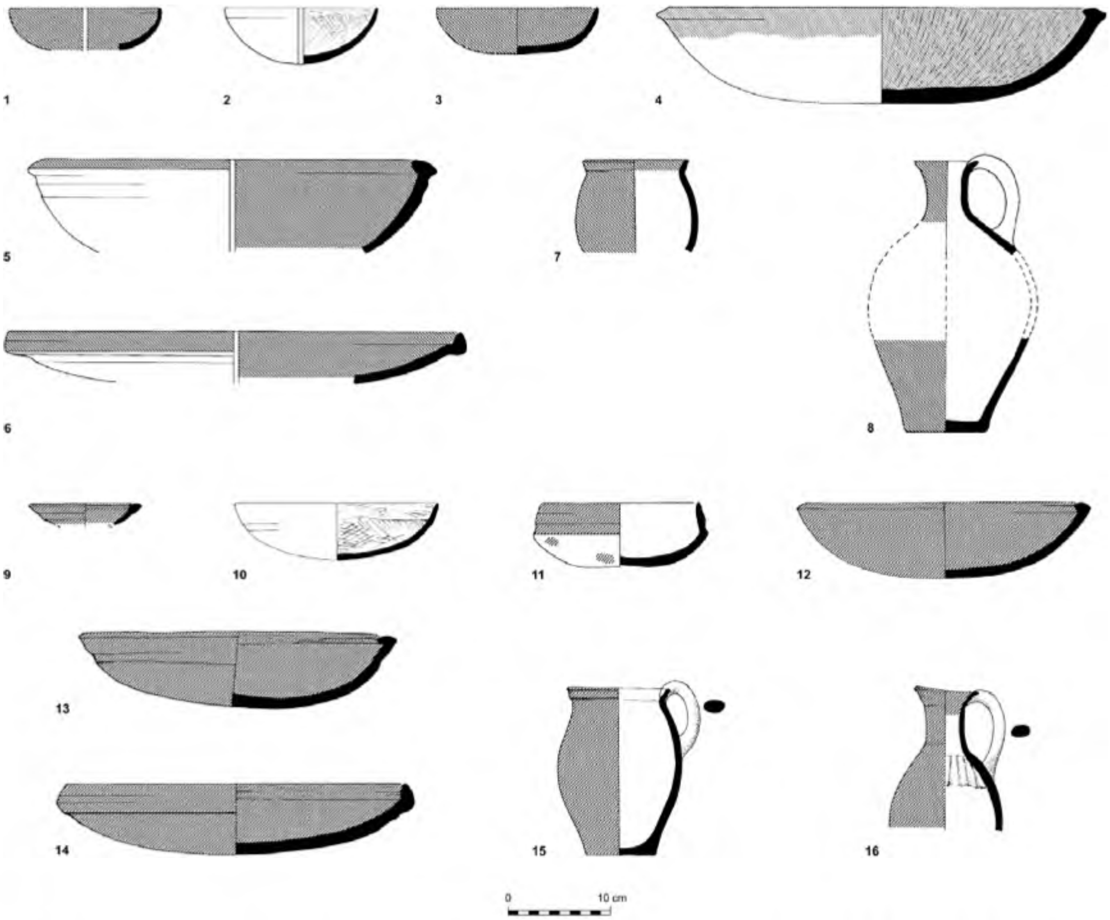

Fig. 8. Presentation vessels from House EY 460: 1–8: vessels from room EY 455A; 9–16: vessels from room EY 618.

dependent function for each of the three units. It is possible that each unit was now inhabited and managed by one nuclear family of the extended family that occupied the compound. This may be a step in the transformation of this Early Period C compound into smaller individual houses in Late Period C.

Late Period C Houses

Although the disposition of finds from houses of Late Period C is not sufficient for analysis, the architectural changes are telling and important for understanding the evolution of the city. In general, houses attributed to this phase are all characterized by a square outline, reuse of earlier walls, construction of interior walls for inner subdivision, and doubling-up of walls between houses, something not seen in the previous phase.

In Area BS, near the city wall and gate, the transition from Early to Late C is marked by continuity in houses on both sides of the main street, with the construction of new walls on the stubs of old ones and maintenance of the external outline of the houses (Greenberg and Eisenberg 2006: 127–29, plans 5.6 –5.7a). The changes

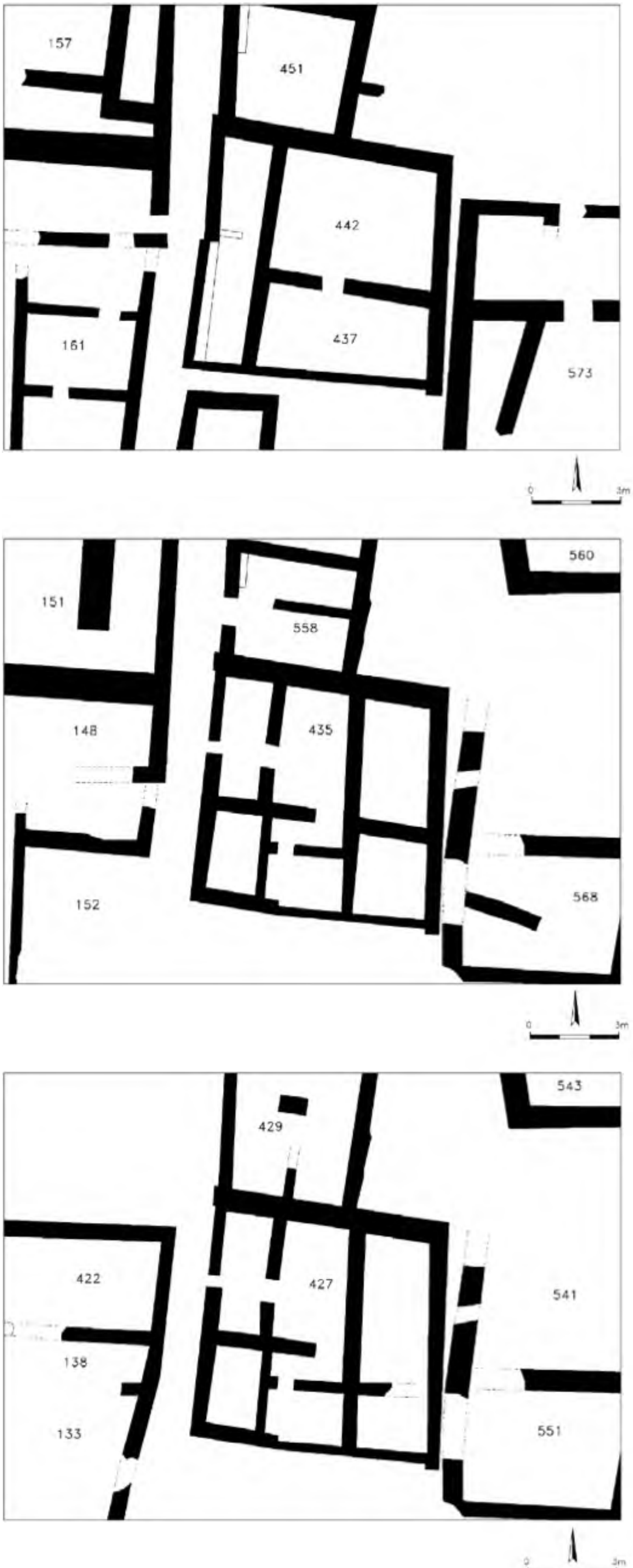

Fig. 9. The development of houses in Area EY in the transition from Late Period C (EB II) Stratum 7 (9a) to Early Period D (EB III) Strata 6A (9b) and 6B (9c).]

between the early and late phases of Period C in Area EY/MS were gradual and not uniform.[14] The general tendency in Late Period C is toward smaller rooms, without pillars, forming houses with an almost-square shape. The central Late Period C structure in Area EY (house EY 442; see fig. 9a) reveals considerable continuity and a high level of maintenance, contrasting with the houses lying both to the east and the west (Eisenberg and Greenberg 2006: plan 8.9). In spite of the different plan and inner subdivision, the house was built for the most part according to the outline of hall EY 460/450 of Early Period C (except for its western side) and walls were constructed on top of mud-brick stubs of the previous phase. The plan of this house is maintained well into Period D (EB III; fig. 9b–c).

Discussion

Three main observations regarding the formation of urban life at Bet Yerah arise from the case studies presented here. First, the EB II urbanism is discontinuous with the EB I village agglomeration. Architectural and artifactual evidence indicate a major reconfiguration of society, with the city as an organizing parameter (Portugali 2000: 321–23; Yoffee 2005: 42–62). The EB II settlement and houses at Bet Yerah clearly do not represent an evolution of the EB I settlement. The data presented here therefore do not support Philip's vision of the Early Bronze Age walled communities as simply the more complex end of a continuum of village sites (Philip 2003). Rather, they represent a new and different settlement form that is commonly termed "urban." This new built environment was a transformative social environment in which the organization of space created new patterns of social, economic, and political relations, and people's identities and participation in local networks of interaction were redefined (Joffe 1993: 72; Yoffee 2005: 42–45, 59–62).

Second, the process of urbanization was not immediate and simultaneous in all parts of the site and levels of life. In centrally located parts of the site, the new city plan and street system were immediately adopted, and small uniform houses were built according to grid at the very beginning of the EB II. However, other areas were incorporated into the grid later in the period, and changes in house plans were made accordingly. In these parts of the site, urbanization gradually infiltrated the household sometime after the "policy decision" to go urban was already made.

Third, the new EB II (Period C) urban configuration was accompanied by a new set of cultural characteristics: site planning and layout, houses, ceramic production, and consumption habits. According to Greenberg (1999, 2011), the EB I–II discontinuity and the introduction of new cultural accoutrements occur throughout the Southern Levant, and the new urban way of life is characterized by an ideology of uniformity. In the following discussion, I claim that this ideology of uniformity was adopted willingly by people and served as a leveling mechanism both between and within sites. In contrast to Yoffee's idea of "simplification" (Yoffee 2005: 91–112), I believe it does not represent an elite political strategy that promotes integration manifested as uniformity. The evidence from Tel Bet Yerah supports this notion of a shared ethos concerning the outward appearance of the community. This ethos was manifested through the different components of the urban built environment and the material culture, which show little evidence of social stratification and differentiation (Greenberg 2011). Thus, a close look at the new EB II cultural package, as revealed at Bet Yerah, may provide a better understanding of the process of urbanization and the nature of local urbanism in the Southern Levant.

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[14] The sequence of construction seems to have begun in Local Stratum 9B and ended in Stratum 7 (Eisenberg and Greenberg 2006: plans 8.7, 8.9). Stratum 8 (Eisenberg and Greenberg 2006: plan 8.8) may depict a configuration that never, in fact, existed. Rather, it represents the process of gradual and dynamic changes in Area EY.

Urban Planning

Early urbanism in the Southern Levant appears in the landscape as a new form of settlement: walled communities in various sizes (Chesson 2003, 2007; Greenberg 2011; Joffe 1993). These settlements altered people's conception of space, creating visible and durable boundaries both within settlements and between cities and their hinterlands (Chesson 2007; Joffe 1993: 68–71; Philip 2003). The degree to which theses settlements were planned varies from one site to the other. According to A. T. Smith (2003: 225–26), differences in city planning are the result of different articulation of political practice, combined with the lived experience of urban environments.

At Tel Bet Yerah there is evidence for a high degree of site planning in Period C (EB II). First, a new concept of settlement was imagined, pre-planned, designed, and put into practice. It required knowledge, labor recruiting and organization, establishing rules, defining boundaries between public and private domains, and an adaptation of the new cognitive map that we term *urban*. The construction of a city wall and orthogonal grid of streets oriented to the cardinal directions dictated the shape, location, size, and alignment of houses. This is clearly seen throughout the site, including some cases where houses were built on a grid before the streets were actually paved;[15] that is, the layout of the town was *imagined* before being carried out. However, the application of the grid plan throughout the site was carried out in steps, and the consequent changes in some houses were therefore gradual (for example, in Area EY). Eventually, by the late part of Period C, the entire site was incorporated into the grid.

As site density increased, the remaining residential compounds disappeared and were replaced by smaller multiroom individual houses,[16] large open spaces were less common, and streets became the main communal places of meeting and interaction between members of the community. The daily movements of individuals exercising their daily practices, and the meanings embedded in the paths taken, shaped and defined the urban space (de Certeau 1984). Streets also served as visible physical boundaries between houses (discussed later this essay). Drawing from A. T. Smith's (2003: 220–31) discussion of the Mesopotamian city of Ur, I suggest that in view of the growing density and fragmentation of both the city and the inner configuration of the houses at Bet Yerah during Period C, the grid plan served to direct and control movement in the city and allowed relatively equal accessibility to all houses.

The well-planned and uniform construction of the city of Bet Yerah and the implications of this planning for movement and accessibility are significant, because it influenced and constrained and, in some cases, controlled daily practices. A. T. Smith

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[15] This is clearly seen in the early phases of Period C in Area BS (Greenberg and Eisenberg 2006: plans 5.4, 5.5, 5.5a)

[16] Eisenberg and Greenberg 2006: plans 8.8, 8.9.

(2003: 70–71) claims that the power to create space is socially meaningful, because spaces reflexively limit practices, but that not all individuals have the same ability to construct or alter spaces and the meanings related to them. In the case of EB II Bet Yerah, the concept of uniformity displayed in the houses and material culture and the communal labor invested in the construction of the city wall and streets were used to bridge this inequality. Uniformity could have helped blur social differences and create a sense of equality that enabled the balancing of social forces within the new urban framework, as well as facilitating the execution of these large-scale projects. Thus, while planning and engineering were not common knowledge, more people could take part in their actual application and in the physical construction of the urban space.

Philip (2001) and Chesson (2003) argue that the lack of evidence for pronounced social differentiation in the EB II towns of the Southern Levant implies a heterarchical organization based on group-oriented "corporate power strategy" (Blanton et al. 1996: 2), in which power is shared by several groups or sectors in the society.[17] Organization of this kind enabled the community to undertake large-scale projects (Philip 2001: 168; Chesson and Philip 2003). The nature and implications of the proposed heterarchical social structure are further discussed below.

Houses and Households

Households have been recognized by scholars as the basic economic, social, and political unit of Early Bronze Age communities (Chesson 2003: 85; see also Joffe 1993: 58, 72; Marfoe 1980). Because the transition from village to urban life involved demographic, economic, social, and ideological changes that affected peoples' lives, these should be reflected, among other things, in the residues of social action left behind in houses (Chesson 2003, 2007).

In the introduction of this essay, I referred to houses as architectural units that represent the spatial loci of social relations and to households as social units. However, drawing from Lévi-Strauss's (1982) house-society model, Chesson (2003, 2007, Chapter 3 above) suggests that Early Bronze Age houses are not merely physical structures in which social relations are performed but rather should be seen as both physical and social institutions. The definition of the house as a social institution (henceforth "House")[18], in the Lévi-Straussian sense, does not necessarily coincide with residential structures or households, which refer to a space in which people co-reside on a daily basis; instead, a House may include more than one residential unit of people who work together to ensure the survival of the House and its members (Chesson 2007; Joyce 2000: 190).[19]

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[17] Recently, Cooper (2006: 60–63) has suggested similar heterarchical organization for early urban settlements in northern Syria.

[18] I use the word "House" when referring to its definition as a social unit, and "house" for the physical structure (see, e.g., Chesson 2007; Hendon 2003).

[19] The definition of *house* as suggested by Lévi-Strauss (1982: 174) has been the subject of various recent discussions and interpretations (e.g., Carsten and Hugh-Jones 1995; Gillespie 2007; Joyce and Gillespie 2000). However, it has been claimed this approach allows archaeologists to analyze the physical expressions of social relations and the way they change through time (Chesson 2003: 82; Gillespie 2000a).

As mentioned previously, Philip (2001: 167–68; 2003: 108–9) suggests that the Early Bronze Age towns of the Southern Levant were organized in a group structure that operated at a supra-household level. According to Chesson (2003, 2007), this supra-household organizational unit is the House. In fact, she suggests that the appearance of walled communities occurred together with a development of a house-society, in which Houses could function as collectives within community and often cooperated or competed with one another (Chesson 2007; see also Gillespie 2000b; Joyce 2000). In some cases, according to the status of a House or individual members of it, people participated directly or indirectly in various activities and projects of the community.

This concept seems applicable to the study of early urban society at Tel Bet Yerah. The formation of the city and the construction of the fortification wall and grid of streets represent deliberate planning at a level above that of the individual household or adjoining domestic compounds. The evidence implies that Houses—as social organizational structures—worked together as a corporate community.[20]

I suggest that, at the beginning of EB II, some general trends are imposed on the site, possibly by joint agreement. The disorder of the EB I settlement is replaced in the early part of EB II by a new order but with some old habits retained. Several houses dated to the early part of Period C have a quadrangular multiroom plan that becomes predominant during the period (e.g., Greenberg and Eisenberg 2006: plans 5.4, 5.5). However, the house presented here (EY 460) is different and indicates that the spatial organization of compounds, typical to the pre-urban EB I, was maintained at least in some houses during the first part of the EB II. Each such compound seems to belong to a household of a joint or extended family and represents a House. The extended family compound bordered by open areas of communal domestic activity in Area EY is located at some distance from the city gate and main streets (Area BS) and differs greatly from the urban discipline exhibited there. However, in contrast to the heterogeneity characterizing the EB I compounds, those of the EB II show remarkable uniformity of architecture, again illustrating the existence of a powerful organizing principle. The construction methods and general appearance of the early EB II compound are the same as those of the coexisting smaller uniform square houses that express a greater degree of urban discipline.

The contrast in house forms and spatial organization at the beginning of EB II suggests that adjusting to the idea of urbanism was a gradual process and that it was not immediately adopted and equally applied by all. According to Greenberg (2011), the urbanizing paradigms of late fourth millennium in the Southern Levant had to be recognized as relevant to, and appropriated by, human agents of change and that the application of these concepts must have overcome resistance within the receiving society, being partially transformed in the process of incorporation in new surroundings. Robben (1989: 583) claims that social demands of the public domain and the community level could be perceived as competing with the needs of the family and household and thus challenge the prevailing domestic *habitus* and affect the way house members interpret their social interactions. Social, cultural, and economic changes may induce new house plans, with new spatial organization of daily practices that will produce and reinforce new domestic practices, which—incorporated with the larger scale social ways—will become self-evident and socially proper (Robben 1989: 583).

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[20] While there is no evidence for ruling elites at Tel Bet Yerah, the existence of some kind of higher authority cannot be entirely ruled out. Fleming (2004) and Cooper (2006: 61–63) suggest that although there is tension between the exclusionary power strategy of individual leadership and corporate political strategy (Blanton et al. 1996: 2), it is possible for both systems to operate together, even in the same settlement. According to A. T. Smith (2003: 230), even when higher authorities are involved, the daily practices of people living in the city are crucial to the creation of the urban spatial experience; therefore, there are connections between these authorities and the lower-scale organizations (A. T. Smith 2003: 230).

At Bet Yerah the corporate mode of operation, using the idea of uniformity, served as an efficient means of overcoming these tensions and facilitating change at the household level. It was the impetus for consequent transformations of the domestic *habitus*. With time, there was a gradual assimilation of the new order into the most intimate family venues. As house-density at the site increased, more streets and alleys were established, and the urban mode of practice seems to have gained traction. In the later part of EB II, the large contiguous compounds disappeared in favor of dense construction of smaller, uniform houses, with growing inner division to many small spaces.

Considering the dialectic relationship between the socially constructed built environment and the reproduction of social order and relations through action of social agents, I believe that the houses of Bet Yerah in EB II, their place in the settlement fabric, and their uniform recurrent characteristics played an important role in imbuing and affirming the ideas of urbanism. This was done through application of an ideology of uniformity and continuity of houses (see below). In his work on houses in 18th century Virginia, Glassie (1975) suggested that the accurate architectonic rules contain a mental structure that is grounded in the shared architectonic repertoire. These rules form a syntax that expressed the world-view of local society at the time (A. T. Smith 2003: 57). In the new urban built environment at EB II Bet Yerah, the various uniform components possibly also served as cues promoting "appropriate" social behavior and communicating various aspects of social and personal identity (Alexander 1979; Alexander et al. 1977; Blanton 1994; Kent 1990; Portugali 2000: 12–13; Rapoport 1990a, 1990b; Souvatzi 2008: 27).

Identities and relationships would have been structured by the physical space within and between the houses. At Bet Yerah, building houses with their outer walls back-to-back against already existing neighboring houses, using streets as boundaries between houses, and the use of inner or adjacent courtyards within the residential complex all point to an emphasis on reinforcing specific House identities in contrast to others (cf., Chesson 2003; Paz 2009). In this new configuration, shared walls may indicate belonging to the same House, possibly replacing the former compounds. In contrast, houses that had no close kinship ties or alliances marked their boundaries by double walls and back-to-back construction.

The marked continuity of house construction is evident throughout the site, even as the settlement's density grew substantially, indicating a strong sense of urban continuity throughout EB II and into EB III. Despite the tendency toward subdivision within houses, the general outline of houses was maintained, and some houses were rebuilt with the same general plan through several strata (fig. 9; see also Paz 2009). The material remains found in these houses also display considerable continuity. Similar continuity in residential complexes has been identified in several other Early Bronze Age walled sites in Israel and Jordan (Chesson 2003: 90–91; Ilan 2001). Patterns of recurrent construction have been interpreted as part of the customary commemorative behavior involved in the construction of social memories at the site level (Cutting 2006; Düring 2005; Hodder 1998; Hodder and Cessford 2004; Tringham 2000: 127, fig. 6–4). Maintaining the house as a physical frame ensured the continuous existence of the household as a social unit and helped to establish the identity, authority, and legal right of households throughout generations (Chesson 2003: 91).

Daily Household Activities and Consumption Habits

The changes in house form and size, the growing inner division of space, and the decrease of open spaces around the houses at the rise of urbanism imply changes in the social structure of households and the spatial organization of everyday activities. The nuclear family became the basic economic unit, and communal activities were either moved away from the houses or delegated to specialists. Daily activities in the EB II houses at Tel Bet Yerah—food production and consumption, storage, and craft production—all operated within the same ideology of uniformity as the architecture. The material culture is characterized by an absence of differentiation between households, and artifacts are produced to a standard, by specialized workshops, and are widely distributed (Greenberg 2011).

At the beginning of EB II, a completely new ceramic repertoire was introduced. Typological and technical studies of this repertoire show that it was composed almost entirely of products made by specialists—either regional specialists who produced the North Canaanite Metallic Ware (Greenberg 2002; Greenberg 2011; Greenberg and Porat 1996; Golani 2003: 81–170) or local specialists who worked within a similar technological paradigm.[21]

According to Greenberg (2002, 2011), the production and use of North Canaanite Metallic Ware clearly involved ideological, not merely technological, considerations. Most importantly, uniformity and durability were favored over diversity and appearance. The typical bowls, mugs, storage jars, and cooking pots comprise a uniform regional package, implying uniform consumption habits of a large number of people using it at various sites. Greenberg (2011) suggests that the social meaning communicated through the North Canaanite Metallic Ware included a denial of social, cultural, and economic contradictions between and within sites. A strong preference for large, flat serving platters suggests that communal meals were an important part of social life (Bunimovitz and Greenberg 2004: 21, 27). This seems to emphasize the collective values of the early urban society (Greenberg 2011).

Possible evidence for communal meals can be seen in the early EB II house of Area EY. As discussed previously in this essay, the north part of this large compound (EY 460) was used entirely for food preparation and had several rather large storage and cooking vessels. Serving vessels were found in the small back chambers in the other units and consisted mainly of platters and bowls and some small jars and jugs. These could have been used for eating in the adjacent halls and stored when not in use. It is possible that special events of communal feasting were held at the compound from time to time. As already discussed, the plan of this house exhibits some resistance to the strict urban discipline at the very beginning of the process. However, its construction method, material culture, and to some extent the spatial organization of activity exhibit the same ideology of uniformity typical of the period. The evidence for possible communal feasting in this house may testify to the fact that its members took an active part in the formation of the city both socially and physically.[22]

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[21] Evidence for a specialized ceramic industry and a potter's workshop at the south part of the mound was found in Area EY (Eisenberg and Greenberg 2006: 354–68) and was studied and analyzed by Iserlis (2007). The cooking-pot industry was to some degree centralized: they were manufactured by specialists in separate workshops (Greenberg 2006; Yitzhak Paz and Mark Iserlis, personal communication).

Members of the household also worked outside of the house and the city's physical boundaries in agriculture, herding, fishing, and in some cases—such as the potter's—possibly in distant markets. Some activities, such as fish-net repair, may have taken place in open shared spaces around the house, as I demonstrated earlier. As settlement density grew, there were less shared open spaces. Activities were shifted from the open areas surrounding the houses to unroofed spaces within the houses, such as courtyards and flat rooftops, or to open areas in the fringes of the city.

Conclusion

In this essay, I have examined the reorganization of society in the Southern Levant at the beginning of EB II through the perspective of houses and households. Through the analysis of house layout, contents, spatial organization, and intra-site contexts at Tel Bet Yerah in late EB I and Early EB II, I have shown that the new urban social, political, and spatial organization brought major changes in domestic life. However, these changes did not occur concurrently in all parts of the site, because in some areas they appeared at the very beginning of the EB II while in others they took place later in the period.

Based on the material evidence, I suggest that the concept of urbanism encountered some resistance and that an urban order was not immediately applied by all. Following Greenberg, I also suggest that the ideology of uniformity served as a means of promoting urbanism and readjusting social relations within and between households. I showed that city planning and the growing density within the walled city led to changes in house size, form, and layout, which reflect changed social relations in the households. However, I believe that while there is a clear shift to smaller houses that may reflect a switch to smaller households made up of nuclear rather that extended families, the inhabitants maintained their old kinship bonds and alliances, operating at a supra-household level as a House. This is implied by the physical relations between some neighboring houses, in contrast to others that have strongly defined boundaries. At a larger scale, I accept Philip and Chesson's suggestions that these Houses worked together as a corporate community to enable the construction of large-scale projects, such as the fortifications and street systems. Eventually, urban order at Bet Yerah gained traction and prevailed for a long time, as is evident in the marked continuity of houses and city plan. Though some changes occurred in the EB II–III transition, the city of Bet Yerah existed until the end of the

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[22] On the role of feasting in social life, see, e.g., Hayden 2001; Hendon 2003; Pollock 2003; Strong 2002.

Early Bronze Age. The study of houses and households at Tel Bet Yerah forms an important part of the multiscalar research of the site. Hopefully, the analysis of material from previous excavations together with further excavations of domestic areas at the mound will contribute to a better understanding of Early Bronze Age urbanism and of the way it affected the lives of people, even within the safe confines of their homes.

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Section 5

Synthetic Household Studies

The Uruk Phenomenon: A View from the Household

Catherine P. Foster

As a theoretical subfield, household archaeology holds exciting potential for contributing to our understanding of the multifaceted characteristics of ancient civilizations. To focus on the basic unit of society—the household—and the individuals, relationships, and activities that comprise that core unit not only allows access to a large portion of the population that is often ignored in archaeological research, but also uncovers the variety of household situations that existed throughout any one settlement. By its very nature, the household, defined here as an activity group that engages in multiple spheres of activity often overlapping in space and time, can provide a rich dataset, which archaeologists can use to ascertain the routines of daily life that both reflect and enact the social, religious, economic and cultural order (Hanks 1990).

The study of this unique socio-economic subset, however, should not be the only goal of household research. Through household archaeology we are able to investigate the small-scale levels of interactions, behaviors and lifeways of household groups that comprise past populations, while at the same time gain a clearer picture of how these groups were embedded within the wider historic contexts specific to their time and place. Therefore, households and the groups they represent should not be analyzed in isolation, but as part of a web of relationships existing between houses and temples, palaces, cemeteries, community spaces, and other houses. In turn, households must be viewed within their even wider sociocultural milieu that exists on the town, city and regional level to successfully incorporate multiscalar approaches to understanding the past.

I have taken this type of approach in my analysis of households at Kenan Tepe, an ancient village community in the upper Tigris region of southeast Turkey, to examine domestic modes of production and consumption (hereafter "DMPC"). Specifically I explore how household-level economies are reflective of larger sociocultural developments that characterized early state formation in Mesopotamia during the Late Chalcolithic (3500–3000 B.C.E.). This was a period of fundamental social change that witnessed the rise of more complex economic systems of trade and exchange on an interregional level as evident in the proliferation of similar ceramic styles, accounting practices, and architecture across the Near East.[1]

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[1] Of the many publications that discuss this topic, Algaze 2005, Postgate 2002 and Rothman 2001 are perhaps the most recent and comprehensive.

In accessing the mechanisms behind this network of interaction, generally referred to as the "Uruk Expansion" or "Uruk Phenomenon," scholars have continued to focus on centralized institutions like temples, public buildings and storehouses whose administrators supposedly governed this large bureaucracy. While this type of evidence is important for our understanding of this phenomenon, it also offers a narrow window through which to perceive Late Uruk society. By ignoring the domestic economy, or the daily production and consumption activities of households, we automatically skew our interpretations based on a limited dataset that favors a top-down theoretical approach that places control of resources in the hands of small elite factions or specialized trading guilds.

I argue households also had a vital role to play in the construction, character and implementation of systems of interaction that define the Uruk Phenomenon. The inclusion of evidence from domestic contexts can aid in balancing the macro-regional focus found in traditional world-system approaches (Algaze 1989a, 2001a, 2001b, 2005). At the same time, the study of Late Chalcolithic domestic economies can move scholars beyond the use of household activities to simply identify cultural or ethnic minorities within indigenous populations (Frangipane 1997, 2001; Stein 1999, 2002a), to consider how these groups interacted on social, economic, and political levels.[2]

The Domestic Economy: Theoretical Considerations

Households are not just the basic unit of society, but the focal point for the enculturation of ancient populations. The hierarchies and internal physical and psychological divisions found within the household reinforce the taxonomic principles underlying the greater society in which the household is situated (Bourdieu 1977). Domestic spaces are also an important arena where social identities are defined, created and emphasized through meaningful action (Hendon 1996). These diverse actions most often fall within the categories of production, consumption, distribution, and socialization (Wilk and Rathje 1982) among others (see Chesson, this volume). Most of these categories can be characterized as economic in nature, thus making household activities the foundation for a domestic economic system. This internal system is not only self-referential, but interacts with external economic and social networks of the larger community and region.

The study of domestic economies is nothing new. Sahlins's (1972) landmark book on domestic modes of production examined how kin-based groups organize labor and work together for common goals. This approach to domestic production, however, held many assumptions. These include economic specialization determined by sexual division of labor, the "naturally" underproductive state of households, and the altruistic nature of their members. Instead newer economic approaches to households go beyond assumptions that categorize them in static terms to understand all the processes that comprise an economy: production, but also consumption and distribution. Understanding domestic economy also means examining individual cases, household by household, to fully realize the diverse ways groups organize, make decisions, and interact—a reality notably overlooked by Sahlins who offered a single classification for all archaic households.[3]

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[2] This chapter is also an attempt to build on another model of political upheaval offered by Johnson (1987, 1988-89) by focusing on the level at which he proposes drastic economic shifts took place at the end of the fourth millennium, namely rural villages and households (see also Foster 2009).

There have been many archaeological studies that exemplify this newer approach to DMPC, highlighting the active participation of households with both internal and external economies on the local level (i.e., settlement and region; Hastorf 1990; Hastorf and D'Altroy 2001; McCorriston 1997; Pollock et al. 1996; Wattenmaker 1994a, 1994b, 1998). This is not, however, a passive engagement where households are subject to the whims of changing social, economic and/or political environments. Instead, based on two examples I offer here, household production and consumption patterns within autonomous agricultural communities can reflect both broader political changes related to developing state-level societies and determined these changes based on practices of crop specialization and intensification and selective consumption.

In their study of everyday life for the Sausa/Xauxa community of the central Andean highlands, Christine Hastorf and Terence D'Altroy found the Inka imperial economy had a significant impact on local Sausa food production and consumption (Hastorf 1990, Hastorf and D'Altroy 2001). Based on paleoethnobotanical remains from household floors and stable isotopes from human bones, they charted diachronic changes in crop production and diet spanning the time between Sausa political independence and their incorporation into the Inka Empire. Increased production and consumption of maize provided evidence the Inka state purposefully intervened in domestic economies by forcing the reorganization of labor to accommodate new tribute demands. At the same time household structures like kinship ties, technology, and other aspects of subsistence production remained surprisingly resilient. These production trends reflect larger political changes occurring throughout the empire, reinforcing the impact of these changes on everyday life. From here, we might imagine how the reorganization of labor affected domestic economies in the long run both in terms of time management and perhaps altered divisions of labor.

Similarly, studies by Patricia Wattenmaker (1994a, 1994b, 1998) on domestic economies at the late third millennium B.C.E. levels at Kurban Höyük in upper Mesopotamia revealed a unique pattern in consumption of specialist-made products that mirrored shifts in the political reorganization of the city. Over time households became more reliant on cloth and ceramics produced by specialist artisans, in particular serving vessels and other table-wares, which exhibit a high level of social visibility. By their selective consumption of these prestige goods, non-elite domestic groups were actively creating the social system in which elites were vying for status by determining which products were and were not symbolically prestigious.[4]

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[3] This "black box" approach to archaic households has been critiqued previously by Wilk (1989). For example, modern ethnographic case studies exemplify decision-making with households and how it affects the domestic economy. Contra Sahlins, equal pooling of household labor and resources may in fact increase production as oppose to decrease it (Wilk 1989: 44).

[4] This is based on the premise that prestige goods, in order to express rank, are only effective if there is some recognition of the goods as symbolizing prestige and if there is a significant demand for them (Wattenmaker 1994b: 111). A modern example would be high end automobiles like BMW or Mercedes. Because of their high cost, they signify prestige (i.e., only the elite can afford them);

I offer these two examples as a testament to the established importance of domestic economies and their interconnected relationship with community and regional systems of interaction, production and consumption. This theoretical framework is ideal for examining the Uruk Phenomenon as it relates to socio-economic developments at the end of the fourth millennium B.C.E. primarily because the incorporation of households can help underscore what scholars of the Late Chalcolithic period have already proposed (and some have actually demonstrated; see Pollock 1990, 1992): the relationships between northern and southern Mesopotamia were pluralistic and dynamic.

The ways in which household-level production and consumption were transformed, directly or indirectly, by shifts in local economies provide a new avenue for examining aspects of the Uruk Phenomenon that remain contested today. These include the primary items of trade, how the system(s) was organized, and who benefited from these regional and interregional interactions. Because the domestic economy is a sensitive indicator of larger socio-political change, we can also use household data to support, modify or disprove models that credit economic stimulus behind the Uruk Phenomenon. This includes models that support a resource procurement strategy (for wood and copper among others), that motivated interactions with greater Mesopotamia by social groups of the resource-poor Uruk hinterland (Algaze 2005). For example, increased production and/or conspicuous consumption of prestige or raw items of production within the domestic economy could highlight motivations for new lucrative interactions with non-local groups. A radical shift in domestic economies could also signify the reorganization of labor and production schedules to accommodate newly established trading networks or to negotiate with the demands of local burgeoning elites.

Methods of Household Analysis

Domestic economies are most successfully distinguished through the analysis and synthesis of multiple lines of evidence, including architecture, ceramics, ground stone, lithic assemblages and faunal and floral datasets. For Kenan Tepe, I have accomplished this through two complementary methods: 1) the diachronic examination of activity areas through macroartifact distribution and patterning and 2) the patterning and densities of microartifacts, minute pieces of stone, bone, and ceramics less than 1 cm in size that have become embedded within the sediment matrix of archaeological loci. Microartifacts represent primary refuse (Schiffer 1987) from an activity, practice or behavior, and are less affected by natural and cultural formation processes of the archaeological record that determine the presence, patterning, and preservation of other traditional artifacts.[5] With both macro and micro datasets used in tandem, one can gain a more holistic picture of the use of space over time within any archaeological context, and domestic arenas in particular.[6]

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however, if through various circumstances the non-elite began buying BMWs, they would lose their symbolic value as status markers.

5. For further studies, see Cessford 2005; Özbal 2006, this volume; Özbal et al. 2004; Rosen 1989, 1991; Rainville 2005, this volume; Ullah, this volume; Ullah and Banning 2007.

6. The methods by which microartifacts were sampled and examined at Kenan Tepe are explained in detail elsewhere (Foster 2009: 118-137; Graham and Smith, this volume; Parker et al. 2009: 94-95).

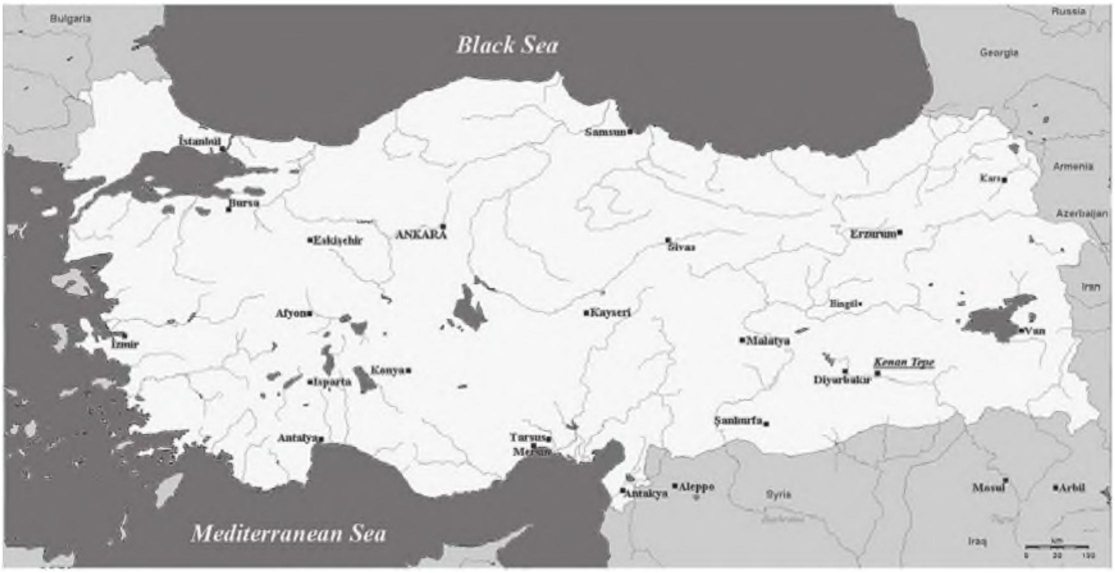

Fig. 1. Location of Kenan Tepe within the upper Tigris River valley in southeast Turkey.

While my analysis of microartifact data relies on a number of early studies concerned with microartifact creation, deposition and preservation (Dunnell and Stein 1989; Fladmark 1982; Hull 1987; Metcalfe and Heath 1990), the methods and results from these procedures are still controversial for two reasons. The first concerns the presence and preservation of microartifacts, which depends on several factors. These include the use of spaces by humans and/or animals, the permeability of soil, plaster or stone matrices that comprise sampled features, post-abandonment disturbances, and the manufacturing processes for the microartifacts themselves. As others have already noted (Cessford 2003, 2005; Rainville 2005), the composition or raw materials used in the manufacture and subsequent decomposition of lived spaces and features can also make distinguishing microrefuse as a product of habitual behaviors extremely difficult.

The second reason is based on the current disjunction in microartifactual analysis as a methodological tool. Though microartifactual analysis is a promising avenue of investigation, the science behind the method remains to be fully developed through more rigorous testing. This involves dialog between scholars to maintain consistency in microartifact identification across projects, as well as introducing new tools and technologies to form standardized methods.[7] In essence, this conference served as the jumping-off point for these new microarchaeological developments as applied to household studies that, in the future, can be more widely accepted. In the meantime, let us turn to my investigation of the domestic economies of several households at Kenan Tepe using these methodologies.

[7] These are some of the primary goals of MicroCommons (www.microcommons.org), a worldwide online research community that provides a centralized database and forum where specialists interested in microartifact analysis and micromorphology can share images, publications, methods, and ideas.

Table 1. Calibrated carbon dates from house lots in Area F.
Late Chalcolithic (LC) chronology based on Rothman 2001.

House Lot #	Trench(es)	Calibrated ^{14}C (B.C.E.)	LC Chronology
1	F1, F4	3523 to 3335	LC 4
3	F7	3360 to 3020	LC 4/5
4	F1, F19, F20, F22	3020 to 2890	LC 5

Late Chalcolithic House Lots at Kenan Tepe

Kenan Tepe is located on the north bank of the Tigris River approximately 10 km east of the modern town of Bismil in southeast Turkey (fig. 1). The 4.5 ha site is composed of a tall central mound and lower town that extends east toward the river (fig. 2). Between 2000 and 2005, members of the Upper Tigris Archaeological Research Project (UTARP) excavated more than 2.5 m of accumulated Late Chalcolithic occupational debris in Areas F and G that included domestic buildings carbon dated between 3500 and 2800 B.C.E. (Table 1). These buildings, and the households that occupied them, are contemporaneous with the generally accepted 300-year-long development and collapse of the Uruk Phenomenon in greater Mesopotamia (LC 3–5; see Rothman 2001); thus, they provide a unique opportunity to investigate diachronic change at Kenan Tepe before, during, and after this period of socioeconomic development.

As discussed elsewhere (Foster 2009: 70–74), the composition of household groups is quite fluid both in their developmental cycle and the opportunity for individuals to be members of multiple households simultaneously. These alone make distinguishing discrete households extremely difficult. Therefore, my research at Kenan Tepe has anchored households to the primary locus of activities: the physical house and its immediate surroundings, collectively called house lots.[8] House lots contain a large area, often bounded, comprised of a primary dwelling unit, adjacent uncovered patio or open courtyard, and garden zone. Both mobility and refuse zones are also present where household members move between spaces and secondary deposition of objects takes place, respectively.[9]

The three house lots from Kenan Tepe described here are chronologically distinct bounded units (Table 1).[10] These particular house lots were chosen because they represent the best-preserved examples of domestic architectural units for the Late Chalcolithic at the site. Their proximity to one another, both in time and space, also presents an ideal opportunity for spatial and diachronic studies of DMPC in this

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[8] The term "house lot" is primarily used in the archaeology of the Americas to refer to residence units within settlements (Alexander 1999; Deal 1985; Hayden and Cannon 1983; Manzanilla and Barba 1990).

[9] It is recognized that these two zones, mobility and refuse, can coexist spatially; that is, refuse can pile up along streets and alleyways between house lots.

[10] Due to considerations of space, it was necessary to exclude a fourth house lot (#2) from this essay. However, data from this context has been included in my more detailed examination of the DMPC at Kenan Tepe (Foster 2009).

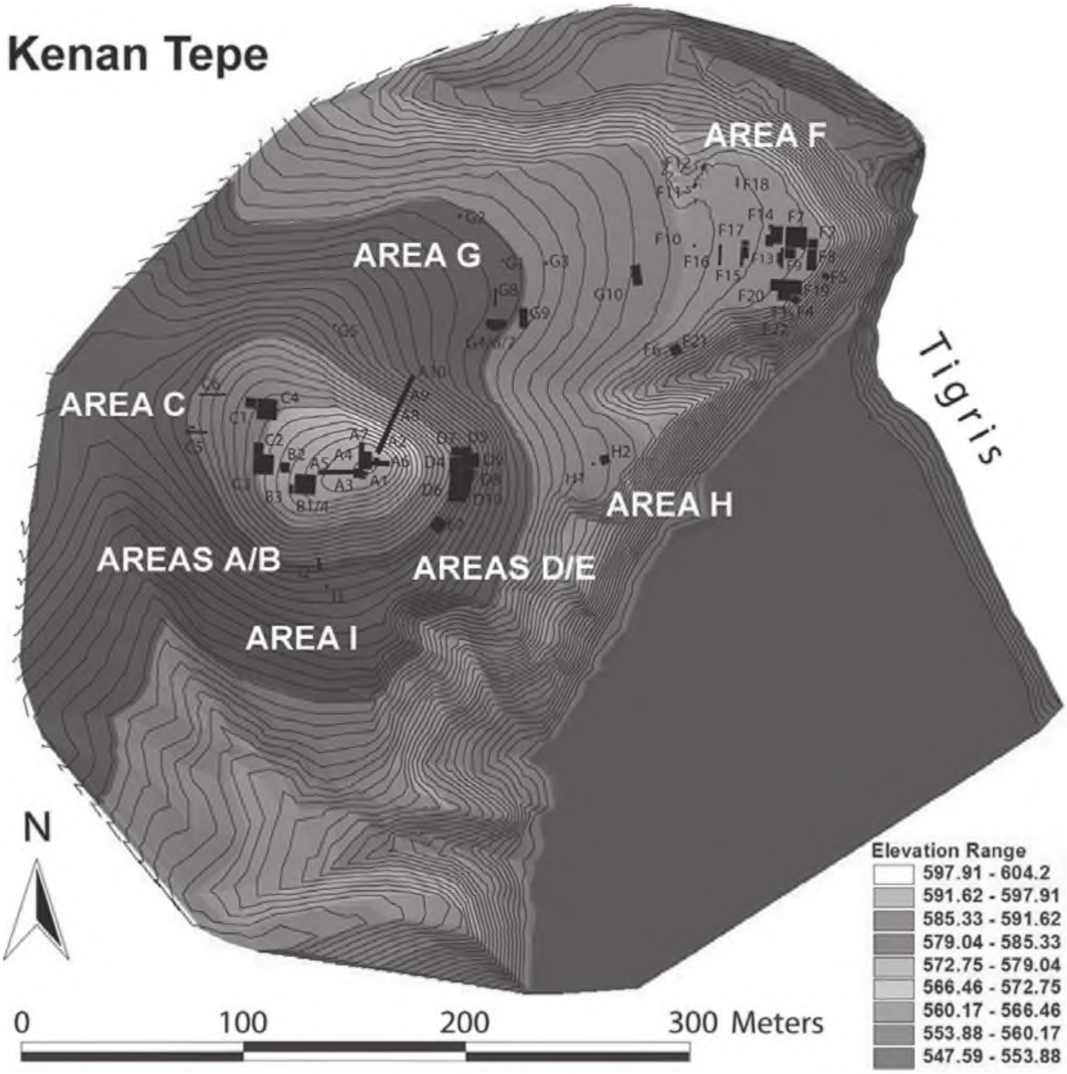

Fig. 2. Topographic map of Kenan Tepe, with excavation areas (prepared by Andrew Creekmore).

area of the settlement. In this section, I describe the primary architectural features of these domestic spaces. In the following section, I discuss the activities that were performed by the users of these spaces. All house lots are located in Area F in the outer town section northeast of Kenan Tepe's main mound.

House Lot 1 spans trenches F1 and F4 on the current edge of the site.[11] This particular house lot underwent multiple building and rebuilding episodes. In the earliest episode, Phase 1, the inhabitants used an outdoor work area comprised of a domed-roof mud-brick oven adjacent to a small structure and compacted pebble

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[11] It is highly probable that the occupied areas of Kenan Tepe during the Late Chalcolithic extended farther east, but due to progressive undercutting and sapping by the Tigris River, these areas have been eroded away (Parker et al. 2009: 86–88).

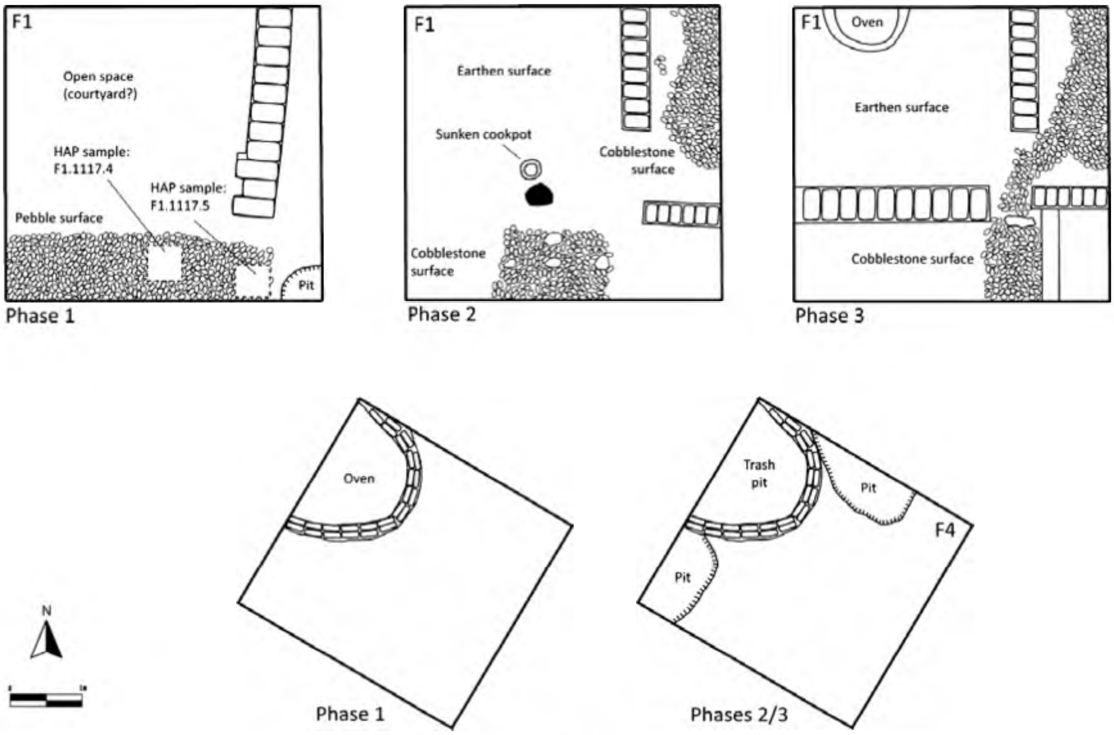

Fig. 3. House Lot 1, all phases.

alleyway (fig. 3).[12] Adjacent to the oven was an alleyway bordering a small structure of which only an ephemeral wall from the earliest construction remained. The street was composed of compacted pebbles set in a coarse clay matrix—common materials easily accessible from the Tigris River below—into which ceramic fragments, animal bones, and lithics had been trampled over the course of its use.

In the second and third building phases of House Lot 1, the oven, along with a pair of adjacent pits, became a locus of trash disposal filled with ash, animal bones, ceramics, and other debris. This was a convenient dumping ground for the inhabitants of two superimposed structures to the north, built of sun-dried mud bricks, with compacted pebble alleyways running in between. These buildings had simple earthen floors, one of which held a flared-rim cooking pot that had been sunk into the floor. In the third and final phase, a large oven or fire pit was built within the central area of the house lot. This roughly circular pit was quite shallow, with only the basal levels preserving a thin layer of ash in the center encircled by a thin residual layer of burned and hardened clay comprising the last vestiges of this installation.

House Lot 3, located in trench 7, featured an irregularly shaped mud-brick structure internally divided into two narrow magazines, which opened onto an undevel-

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[12] This pyrotechnic feature has been designated as an oven because there is no evidence for the production of ceramics anywhere within House Lot 1 to substantiate its function as a kiln. The mud bricks likely represent the outer shell of this feature, which would have contained an inner central core (or two?) in which bread and other foods could have been baked. This style of domed oven is similar to the *tandır*s in modern Turkish villages (Parker and Uzel 2007).

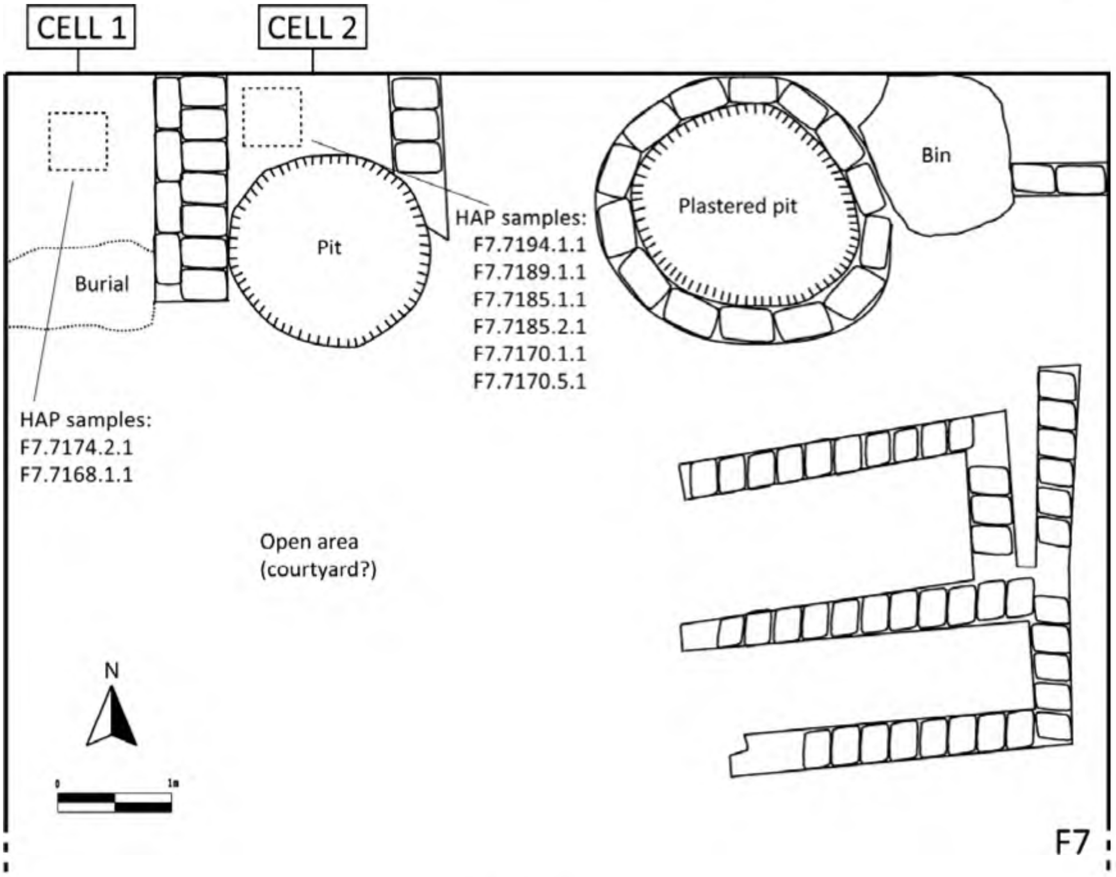

Fig. 4. House Lot 3.

oped, open area (fig. 4). North of the building was a large circular debris pit lined by a single row of mud bricks, a shallow ovoid bin lined with mud plaster, and a small mud-brick wall. To the northwest stood another building composed of at least two cells with mud-plastered floors; this building was later burned and heavily damaged. With such a small amount of this presumably larger structure excavated, it is not surprising that no permanent installations were uncovered. The preservation of the surfaces was, however, quite good, allowing for numerous superimposed microsamples to be taken and later compared (discussed in the following section).

House Lot 4 is quite large in comparison with the others, spanning trenches F1, F19, F20, and F22 (fig. 5). This structure was constructed of plastered mud-brick walls, with cobblestone foundations and a mud-plastered surface covering the entire interior space. The southern walls adjoined to form a double wall to provide either structural reinforcement or, more likely, an additional room. The deeper foundations of this southernmost wall provide evidence that these two buildings were constructed at different times. There is further evidence for slight modifications to the building in the form of blocked doors or passageways, one separating the main structure from the abutting building and one possibly separating two rooms inside of the main structure. Inside the (courtyard?) space of Room 1, a large brick oven

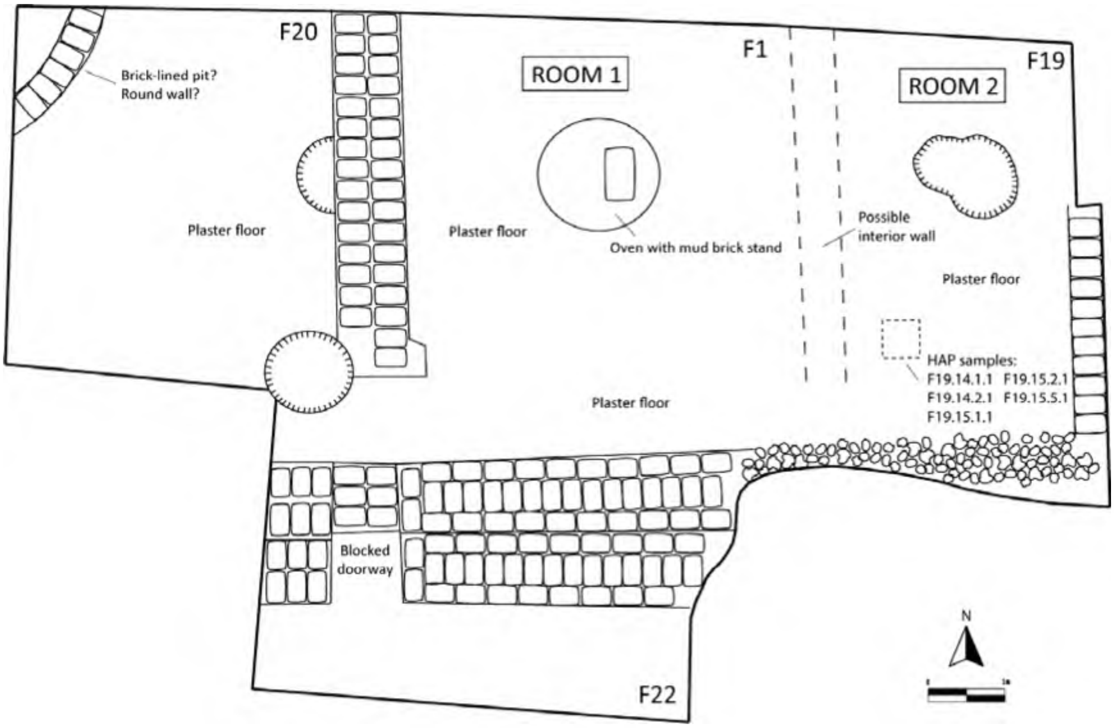

Fig. 5. House Lot 4.

was built with a permanent mud-brick pedestal or stand inside. In Room 2, a shallow, irregularly shaped pit was later sunk into the mud-plastered floor. Though no obvious brick superstructure was recovered, the contents of this pit—ash, slag, and a hardened red bottom—suggest that it was possibly used for pyrotechnic activities.

While the architecture and permanent features of these domestic contexts provide an anchor in physical space for household groups, it is the activities, interactions, and relationships that truly define and characterize households. It is to this particular body of evidence that I now turn for the house lots at Kenan Tepe to highlight the lived space for each of these groups and discern their domestic modes of production and consumption.

Domestic Modes of Production and Consumption

As previously stated, DMPC that comprise a domestic economy are most successfully recovered and distinguished archaeologically through the analysis of multiple types of evidence. The following represents a case study of this approach for House Lots 1, 3, and 4 from Kenan Tepe; I present elements of agriculture (specifically plant cultivation and livestock), cooking and eating, chipped stone technologies, cottage industries, and aspects of symbolic practice.[13]

[13] Due to space constraints, these categories should be considered as a baseline investigation of DMPC, which could include a plethora of other activities and behaviors not mentioned here.

House Lot 1

Production and consumption activities for the earliest Late Chalcolithic household excavated at Kenan—House Lot 1—are wide-ranging. First and foremost is agricultural production. Admittedly, plant cultivation is difficult to detect in house lots, since most of the activities that make up this type of production—such as growing, harvesting, and threshing—take place mostly beyond living spaces (White and Wolff, this volume). However, the large oven from House Lot 1 proved to be rich in archaeobotanical remains, such as two-rowed hulled barley (*Hordeum distichum*), einkorn (*Triticum monococcum*), emmer (*Triticum dicoccum*), and probably spelt (*T. spelta*) wheat.[14] The presence of glume bases, rachis fragments, and spikelets provides evidence for the processing, storage, and transportation of these cereals in their raw forms (Parker et al. 2003: 122).[15]

Where these cereals were stored is unclear, because no fixed installations such as bins or silos belonging to any phase of occupation survive. This same trend is echoed in the ceramic assemblage, where only a small percentage (6%) of the overall corpus (N=298) are storage vessels such as ledge-rim collared jars, necked jars with everted rims, or pithoi (fig. 6F, J).[16] This means that either foodstuffs were stored outside the immediate house lot as part of community-based storage or they were kept temporarily in perishable containers such as baskets or wooden bins.

Along with cultivated plants, the oven and other pit assemblages from House Lot 1 contained a number of field or riparian species usually associated with animal feed, such as sedges and reeds (*Cyperaceae*), wild grasses (*Galium, Scirpus, Gramineae*), and wild legumes. The type and abundance of these field species support an assemblage used for foddering of animals as opposed to deposition through seed rain (Minnis 1981). Based on the faunal assemblage, these domestic animals included sheep and goats (29%, NISP=176) and to a lesser extent pigs (14%) and cows (11%). Mandible specimens provide evidence that many of these animals were not consistently used for secondary products such as milk, wool, or traction but were instead culled at prime age (two to three years old) for meat consumption. This conclusion is substantiated by cut-marks (i.e., breaking of the distal ends, deep chopping) and the presence of all parts of the carcass (not choice cuts), which is consistent with onsite butchering practices. A lack of evidence for gnawing on the bones by dogs and other scavengers that would have disturbed the spatial patterning of the assemblage further demonstrates that these animals were primarily consumed and discarded within the house lot.

Other foods include legumes, peas, nuts, and grapes, which likely derived from a household garden or small orchard. Wild food resources such as birds, hares, fish, freshwater crab, and red deer were also consumed. As previously discussed, wheat and barley were a mainstay for this household, with a high level of basalt grinding

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[14] These botanical remains do not represent primary refuse associated with this oven. However, they do represent the domestic plant assemblage from later phases in the use-life of this house lot by household members.

[15] For complete tables of archaeobotanical results from these house lots, see Foster 2009: 193-94, tables 4.5, 4.6; and Parker et al. 2009: 120–22, tables 7 and 8.

[16] Diagnostic sherds that could be typologically categorized based on function represent 18% (based on sherd weights available) of the ceramics analyzed for House Lot 1. The percentage of functional types is based on sherd count.

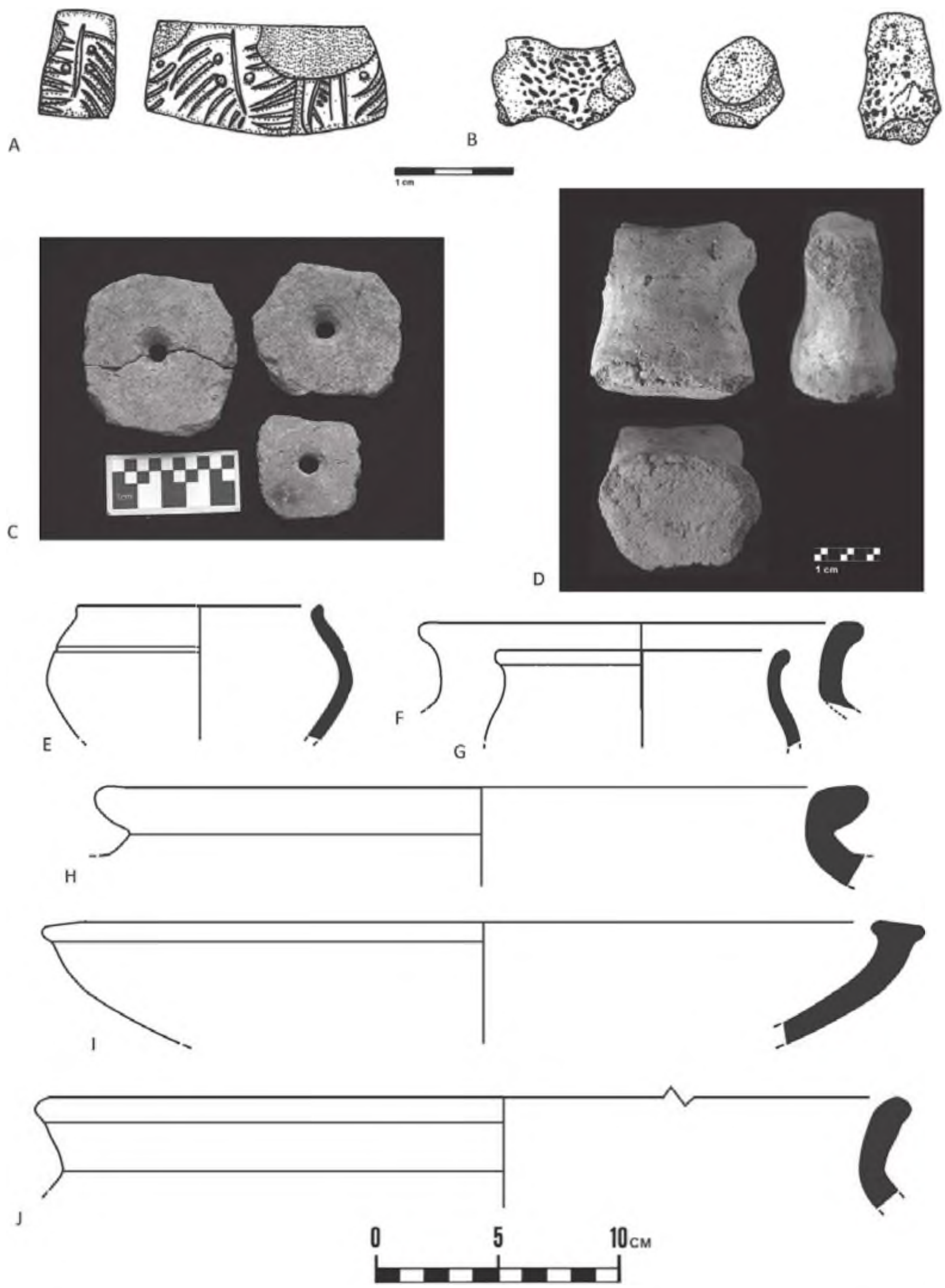

Fig. 6. Objects of domestic economy for House Lot 1 at Late Chalcolithic Kenan Tepe (courtesy of UTARP Digital Archive).

querns, mullers, pestles, and pounders attesting to the processing of cereals into flour for breads and stews. These tools would also have been extremely helpful in grinding nuts for meal. The sheer size of the oven—2 m in diameter—either signifies production exceeding the level of a single household or, more likely, the sharing of this pyrotechnic resource between household groups or within an extended household.

Both meat and plant products were also cooked above open wood fires in small globular cooking pots (fig. 6G) elevated on andirons, several of which were found inside the house-lot debris (fig. 6D). The location of these cooking fires is not apparent for the excavated portion of this house lot—that is, unless the oven from Phase 3 was not in fact a closed oven but an open fire pit.[17] The low overall amount of cooking wares in the ceramic assemblage further substantiates the hypothesis that most cooking activities took place in other locations, outside of the immediate house lot, perhaps outdoors in communal areas. Regardless, the food from these cooking activities was served and consumed on-site using a variety of vessels such as open platters, casseroles (fig. 6H), hammerhead rim bowls (fig. 6I),[18] beaded rim and carinated cups (fig. 6E), and bowls/platters with pedestal bases.

Based on the chipped stone assemblage, this household preferred chert (71%, N=135) in their tool kits, which is locally available from the river gravel and terraces. Black and green obsidian, on the other hand, comprise much less of the assemblage (29%), likely because it had to be traded or carried from Nemrut Dağ/Bingöl and Meydan Dağ, 150 km to the north. Flakes make up the majority of the chert artifacts and are evenly distributed across the entire house lot both spatially and chronologically. The presence of cores, retouched pieces, and final products such as piercers and tripartite blades attests to production, though there is no spatial or numerical correspondence to represent primary knapping activities. This could also be the result of habitual cleaning of work areas, which is prevalent for reductive technologies, such as knapping, that produce large amounts of sharp, dangerous waste.

However, this assertion is not substantiated by the microdata illustrated in fig. 7, which shows an overall low density for microlithics recovered from microsamples in this house lot. A denser accumulation of obsidian microdebitage in the cobbled alleyway adjacent to the Phase 1 oven compared to the neighboring pits is the only visible spatial patterning. This is an interesting trend because these microlithic results contrast sharply with the abundant lithic macroassemblage discussed previously. How then can this discrepancy be explained? Thorough cleaning of work areas has already been suggested. There is also a possibility that the microlithics in the alleyway represent displaced debris, with individuals tracking in microlithics from a work area nearby that was not directly associated with this house lot.[19]

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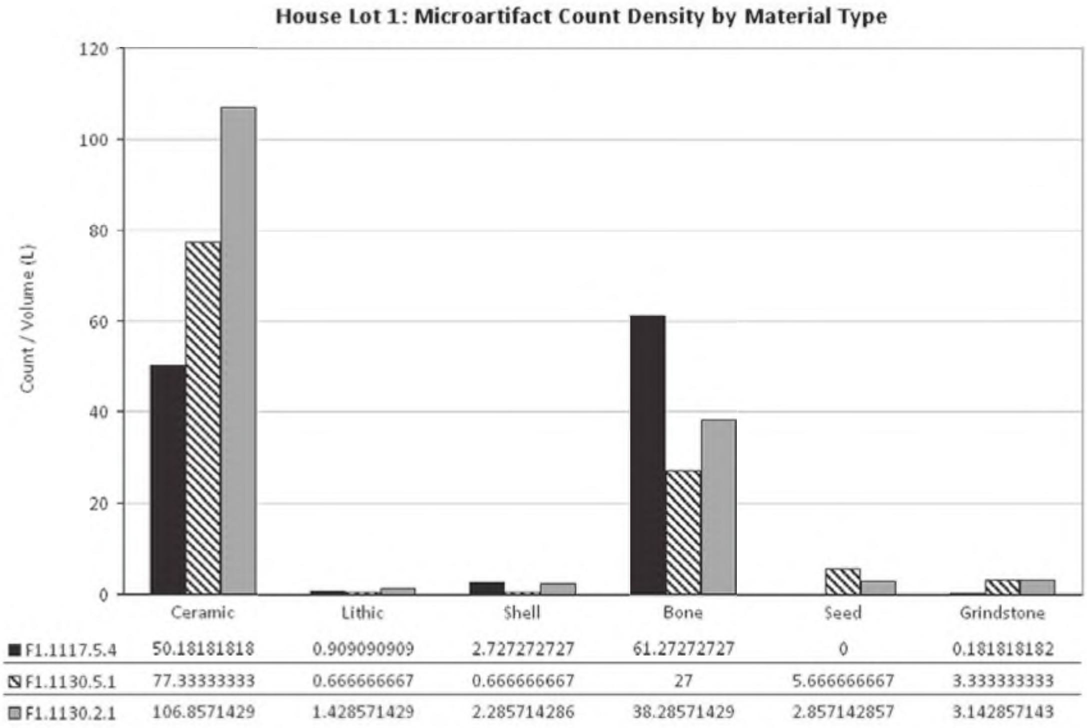
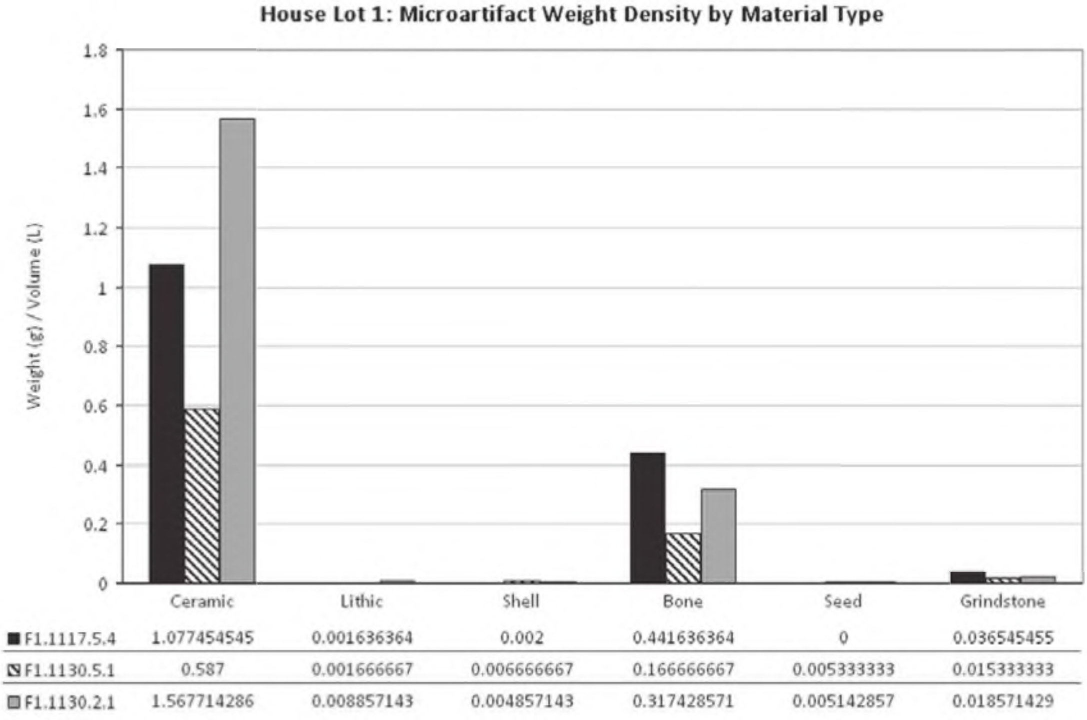
[17] Unfortunately, this feature was only preserved to a few centimeters in height, enough to show a pit filled with ash encircled by mud bricks.

[18] Both "casseroles" and "hammerhead bowls" at neighboring sites have been equated with cooking and serving/eating (Pearce 2000a, 2000b). Based on my analysis of these vessel types at Kenan Tepe, there is little evidence for charring or burning that would have resulted from their use as cooking vessels. This could also be due to the fact that at other sites, such as Hacınebi, for example, many more whole vessels (including, most importantly, the base and lower portions of the body) were preserved in the assemblage.

[19] See Ullah (this volume) for a similar occurrence.



	Ceramic	Lithic	Shell	Bone	Seed	Grindstone
■ F1.1117.5.4	50.18181818	0.909090909	2.727272727	61.27272727	0	0.181818182
▨ F1.1130.5.1	77.33333333	0.666666667	0.666666667	27	5.666666667	3.333333333
▩ F1.1130.2.1	106.8571429	1.428571429	2.285714286	38.28571429	2.857142857	3.142857143



	Ceramic	Lithic	Shell	Bone	Seed	Grindstone
■ F1.1117.5.4	1.077454545	0.001636364	0.002	0.441636364	0	0.036545455
▨ F1.1130.5.1	0.587	0.001666667	0.006666667	0.166666667	0.005333333	0.015333333
▩ F1.1130.2.1	1.567714286	0.008857143	0.004857143	0.317428571	0.005142857	0.018571429

Fig. 7. Microartifact count and weight densities for House Lot 1, with most common material categories (ceramic, lithic, animal bone) and subcategories.

The most archaeologically visible industry for House Lot 1 involves textiles. While the evidence for actual textile production is minimal, there is ample evidence for the spinning of fibers into usable thread. Ten spindle whorls, in the form of pierced ceramic disks, were deposited inside the large oven when it became a refuse bin in Phases 2 and 3, and six more whorls were recovered from inside the house lot itself (fig. 6C). Averaging 30 g in weight and 6 mm in diameter, these whorls most likely spun short, fine wool and possibly long flax fibers into tight threads (Barber 1991). Wool would have come at least in part from the few sheep that were left to mature (see previous discussion on faunal remains), while flax could have been grown or collected wild from the marshy banks of the river.[20]

In addition to spinning, the presence of bone pins, awls, and tiny stone and shell beads attest to the production and use of clothing and various forms of adornment. In fact, the diameter for at least two pins from this assemblage (2 to 3 mm) falls within the maximum diameter of all the beads, reinforcing the possible use of these objects in the threading or sewing of beads onto necklaces and clothing or as tools (awls) for the drilling of the beads themselves (Moorey 1994: 107). It is unclear whether a ceramic cylinder seal, recovered adjacent to the large oven, played a role in these household industries (fig. 6A). The geometric intaglio design with vegetal motif is reminiscent of other seals at contemporary Tell Brak, Norşuntepe, and Hassek Höyük; however, there seems to be no evidence that the seal was frequently used. Based on the medium (ceramic) and rudimentary construction (off-center perforation, relatively unskilled execution), this seal most likely represents a local imitation of stone seals characteristic of southern Mesopotamia and therefore signals some kind of interaction or, at the very least, knowledge by this household of the economic and artistic trends happening beyond their doorstep.

Finally, aspects of symbolic representation and practice based on the archaeological remains at House Lot 1 were very minimal. Only a single zoomorphic figurine was recovered from this context (fig. 6B); it had been very badly burned and damaged, likely due to its final deposition inside an ash pit from Phase 1. From the remaining torso, rump, and back legs, one can distinguish the animal as a caprid with a short, stubby tail whose body had been impressed with irregularly shaped punctuations to represent either wooly hair or pigment spots on the coat.

Overall, the householders occupying House Lot 1 likely spent a large portion of their time on agricultural tasks, specifically the cultivation of barley and various wheat species that could then be ground into flour using basalt tools, baked, and consumed. The processing and consumption of these cereal products (in breads, stews, etc.) seem to have been accomplished within a relatively short period of time, because there is no substantial evidence for long-term storage in pithoi, bins, or lined pits. This household also ate legumes, peas, nuts, and grapes from either a cultivated orchard or household garden. Along with plants, they foddered and tended herds of domestic sheep and goats, which were then butchered locally to utilize their meat resources. Pigs and cattle were consumed as well (but to a much lesser extent), as were wild species of bird, hare, red deer, fish, and freshwater crab. Food was stewed in globular cook-pots elevated above open fires by use of ceramic andirons. The manufacture of chert and obsidian tools seems to have occurred somewhere nearby, perhaps in a larger courtyard space that remains unexcavated. However, the use of these implements is evidenced by the presence of flakes, blades, and piercers. Spinning and possibly weaving and bead production were also practiced, likely as a cottage industry, with a portion of the final products then distributed outside of the household. A zoomorphic figurine attests to at least a low level of symbolic systems at work within the household group.

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[20] While the archaeobotanical record for this house lot does not contain any flax seeds (*Linum usitatissimum or bienne*), this does not disprove the use of flax by this house lot. In fact, the best bast fiber derived from the stem of the flax plant is actually harvested before the seed develops (Barber 1991: 12).

House Lot 3

As with House Lot 1, the best-preserved botanical evidence for cultivation of plants by the household members of House Lot 3 derives from pits that represent oven rake-out deposits. Cereals such as barley (*Hordeum* sp.), emmer (*Triticum dicoccum*), and other wheat species (*Triticum* sp.) were accompanied by internodes, glume bases, rachis fragments, and spikelets, providing evidence for the local processing of these cereals after cultivation and harvesting. These products were then stored in pithoi and necked jars with everted rims, which comprise a larger percentage of the ceramic assemblage (11%, N=75) relative to House Lot 1 (fig. 8E). Further indications that domesticated animals were foddered and their resulting dung used for fuel are provided by the cooccurrence of grass peas (*Lathyrus* sp.), wild seeds and legumes (*Adonis* sp., *Medicago radiata*), caprid dung, and intact pellets (Parker et al. 2009). These domesticated animals included cows, sheep, goats, and pigs, all of which show a level distribution in percentages of number of identified specimens (NISP).

Based on chopping and slicing marks on the bones, it appears that many of the animals raised by this household were skinned and disarticulated locally at prime age for their meat. Wild resources include pigs, red deer, gazelle, and fish, which were caught from the river using nets and weights (fig. 8B). Legumes were another staple of the diet, which was rounded out by various barley and wheat products that were processed on basalt querns and mullers found inside the magazine structure and that exhibit heavy, extended use.

The ovens that baked the bread dough resulting from these ground cereals have not been located, but they were likely positioned within or adjacent to the northern portions of the burned building that remain unexcavated. Heavy fracturing of the bones for possible pot-sizing suggests that animals (along with plants) were likely stewed in globular coarse-ware cook-pots with lids (fig. 8D) elevated above wood- and/or dung-burning fires by the use of ceramic andirons, several of which were recovered in this house lot. The majority of the ceramic assemblage (57%, N=75), however, retains a serving-related function with forms ranging from open simple rim bowls and platters (fig. 8 H–J) to carinated cups and footed bowls (fig. 8F, G), a trend that is echoed in the microsamples from this house lot.

Based on 12 samples taken from pits and several superimposed surfaces inside the burned structure in House Lot 3, medium-ware microceramics representing mostly serving vessels dominate the microceramic assemblage from Cell 2 (F7.7194.1.1, F7.7189.1.1, F7.7185.1.1, F7.7185.2.1, F7.7170.1.1, F7.7170.5.1), while coarse cook-

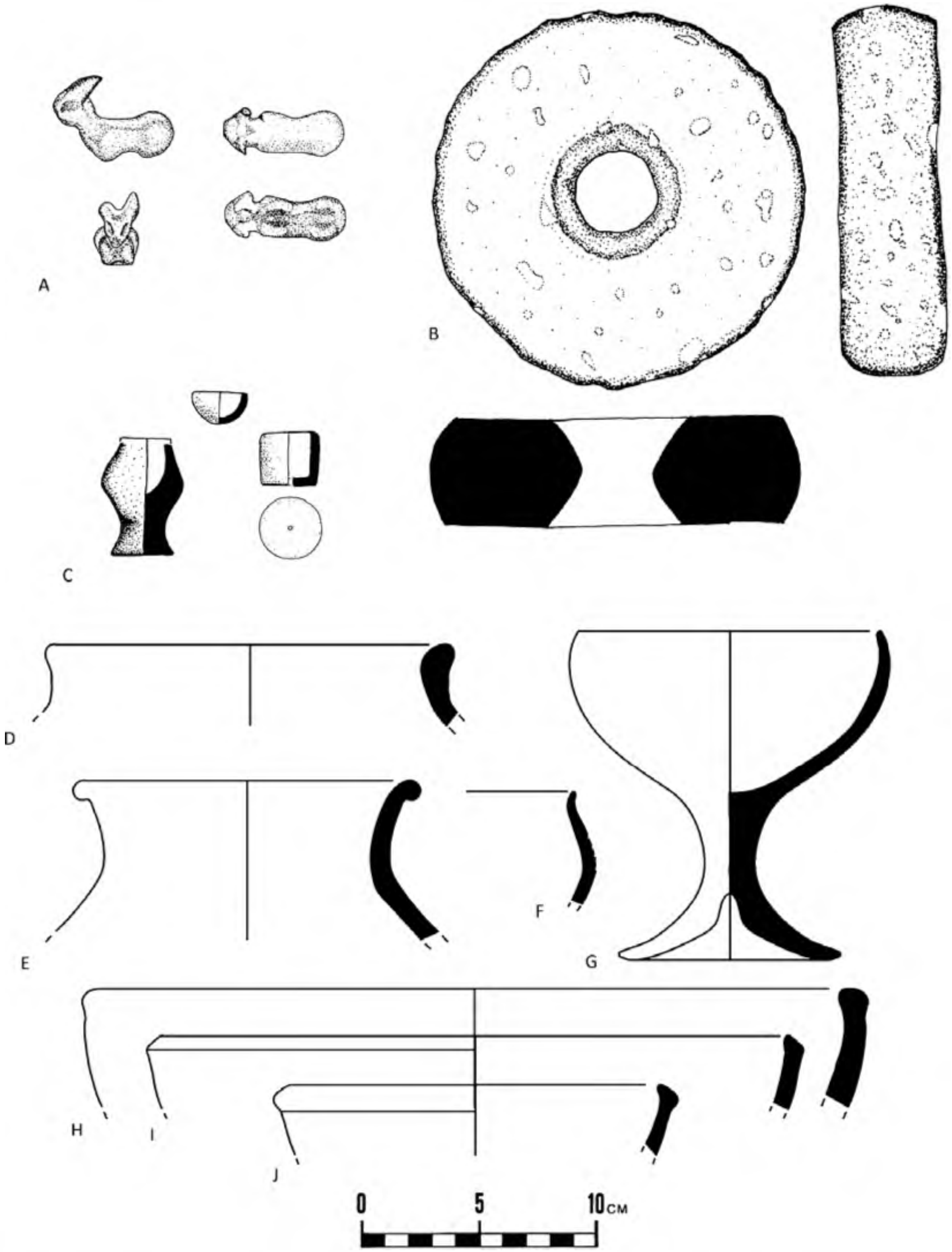


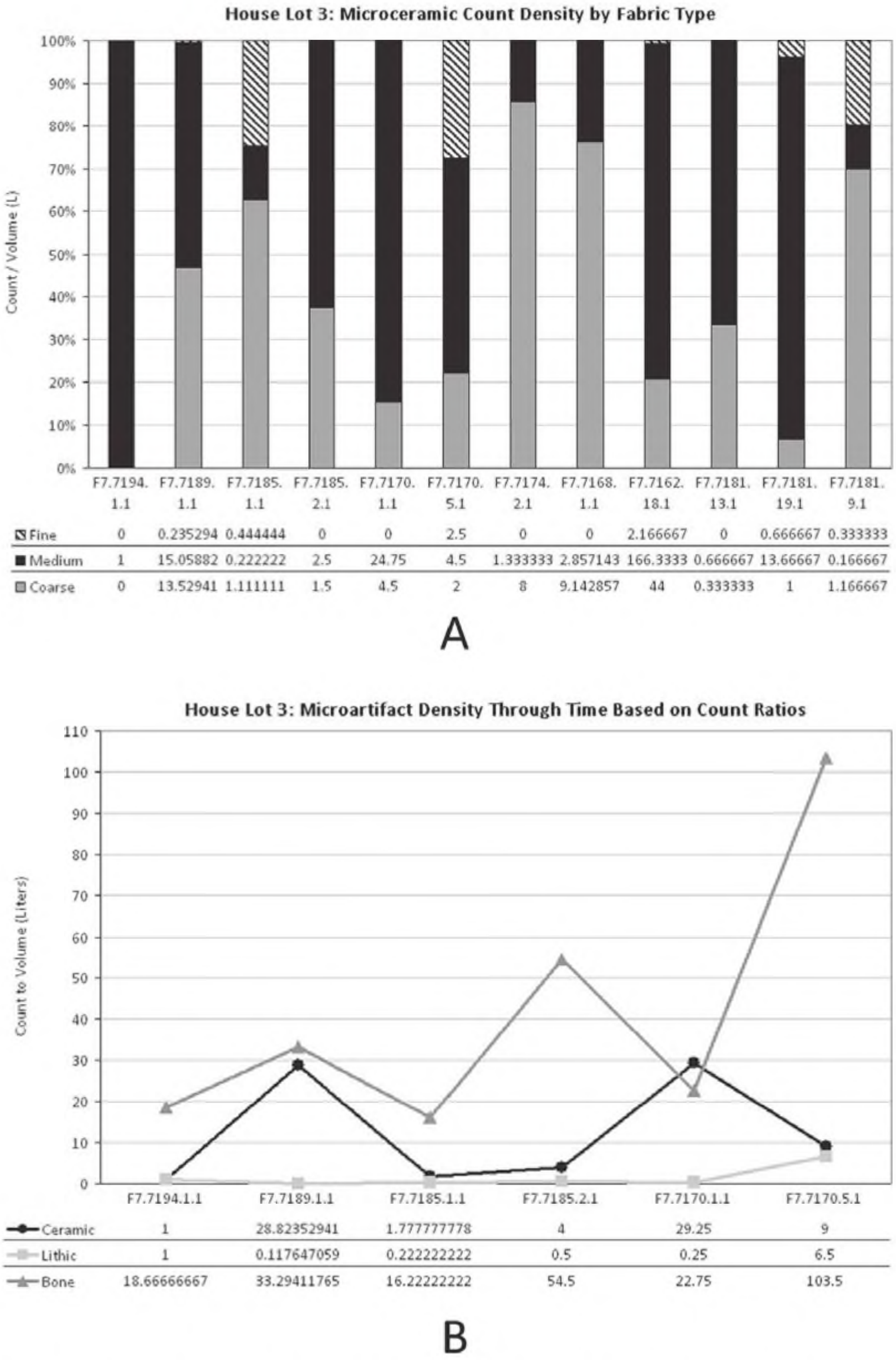
Fig. 8. Objects of domestic economy for House Lot 3 at Late Chalcolithic Kenan Tepe (courtesy of UTARP Digital Archive).

ing wares are proportionately higher in Cell 1 (F7.7174.2.1 and F7.7168.1.1; fig. 9A). Densities of microceramics and microbone remain relatively constant throughout the use-life of this latter space (Cell 1; fig. 9B), except in the final surface of this room (F7.7170.5.1), where there is a dramatic increase in bone density. This likely represents either higher levels of bone processing or consumption of meat during this phase.

Chert was the material preferred by this household for chipped-stone tools, making up 80% of the total assemblage (N=99). The majority of these remains are flakes derived from all stages of core reduction, including large early-stage flakes with visible cortex, flake cores of changed orientation, and retouched blade fragments (Elizabeth Healey, personal communication). Green and black obsidian were also worked, though in much smaller quantities. The level of retouch and the overall character of the assemblage suggest production by nonspecialists, as is the case with House Lot 1. However, these lithic remains derive primarily from pits and fill levels inside the magazine structure and were not associated with surface or destruction debris from the burned building. The same trend is found in the microsamples, where the lowest density of microlithics occurs in surfaces and the highest in pits and fills (fig. 9B). This pattern suggests that the actual production of stone tools most likely occurred away from the living quarters, perhaps in the adjacent courtyard, and the manufacturing debris was deposited in these discrete areas as secondary refuse.

Frustratingly, the household of House Lot 3 seems to have partook in craft production that is either not visible archaeologically or that required deposition of manufacturing tools and debris elsewhere. No spindle whorls, loom weights, needles, pins, or awls were recovered, nor were there any indications of the production of ceramics, metals, or other specialized crafts. Only a single shell bead (3 mm in diameter) and microbead (4 mm in total size) were recovered from the plastered pit north of the magazine structure. However, where overt evidence for crafts is lacking, rich aspects of symbolism are present. Two zoomorphic figurines were deposited together, along with a miniature bowl, in the larger pit cutting the burned structure. These figures depict a heavily damaged caprid and a recumbent quadruped (fig. 8A) with either horns (if a caprid) or large ears (if a donkey). Other miniature vessels include a straight-sided cup with a pierced flat base and a footed bowl or jar that mimics larger pedestal bowls in the ceramic assemblage (fig. 8C).

In summary, the household of House Lot 3 participated in all stages of agricultural production including animal husbandry and the processing of barley and wheat. These cereals were ground into flour on basalt slabs, baked into bread in a shared oven located in an alleyway or other house lot not excavated, and then consumed. Legumes and peas were also eaten, along with meat from domestic flocks that reflect a diversified diet of pigs, cows, sheep, and goats. Red deer, gazelle, and fish caught with nets supplemented their diet. These animals were butchered locally by the household and stewed in covered pots above open wood and/or dung fires elevated on ceramic andirons. Stone tools such as flakes and blades made from locally available chert and imported obsidian were likely knapped in the open courtyard space between buildings, which would have afforded adequate light and work space. Finally, the symbolic system included not only zoomorphic representations in clay but also miniature vessels that mimic "normal-sized" vessels.



House Lot 3: Microceramic Count Density by Fabric Type

	F7.7194. 1.1	F7.7189. 1.1	F7.7185. 1.1	F7.7185. 2.1	F7.7170. 1.1	F7.7170. 5.1	F7.7174. 2.1	F7.7168. 1.1	F7.7162. 18.1	F7.7181. 13.1	F7.7181. 19.1	F7.7181. 9.1
▨ Fine	0	0.235294	0.444444	0	0	2.5	0	0	2.166667	0	0.666667	0.333333
■ Medium	1	15.05882	0.222222	2.5	24.75	4.5	1.333333	2.857143	166.3333	0.666667	13.66667	0.166667
▩ Coarse	0	13.52941	1.111111	1.5	4.5	2	8	9.142857	44	0.333333	1	1.166667

House Lot 3: Microartifact Density Through Time Based on Count Ratios

	F7.7194.1.1	F7.7189.1.1	F7.7185.1.1	F7.7185.2.1	F7.7170.1.1	F7.7170.5.1
● Ceramic	1	28.82352941	1.777777778	4	29.25	9
■ Lithic	1	0.117647059	0.222222222	0.5	0.25	6.5
▲ Bone	18.66666667	33.29411765	16.22222222	54.5	22.75	103.5

Fig. 9. Microartifact count and weight densities for House Lot 3 with most common material categories (ceramic, lithic, animal bone) and subcategories.

House Lot 4

Elucidating the nature and degree of plant cultivation in which this household engaged is hampered due to the fact that botanical remains were not preserved in any of the sixty samples that were collected. Likewise, the density of micro-organics such as seeds are miniscule, compared to House Lots 1 and 3. This absence could be due to several factors, including poor preservation, nonporous surfaces (in the case of microsampling), rigorous cleaning, or a specialized household group. A tenuous hypothesis is that only the finished products of cultivation such as the naked wheat, barley kernels, and field crops were either given to, or exchanged with, this household for other products. This could explain the absence of plant-processing by-products, but the presence of several basalt grinding implements from occupational surface debris show extended and continuous use.

Without a botanical assemblage, it is likewise difficult to consider animal husbandry practices such as foddering, though the remains of domestic animals such as sheep, goats, and pigs underscore their utilization. In fact, pig dominates the faunal assemblage (60%), with cows, then sheep and goats, wild red deer, and fish comprising a relatively small percentage of animals consumed. Instead of being supplied with cuts of meat, this household seems to have butchered these animals in-house, because all parts of the carcass are represented, having been deposited in neighboring dump pits and from debris inside the main structure. Evidence for actual cooking of this meat is low because only 16% of the total ceramic assemblage (N=92) are cooking vessels (fig. 10E), compared to 66% that are serving- and eating-related, including hole-mouth jars (fig. 10B), hammerhead rim bowls (fig. 10A) to simple bowls and casseroles (fig. 10D, H), and fine-ware cups (fig. 10C).

Chert flakes with evidence for retouching dominate the lithic assemblage and, along with the presence of cores, blades, and a scraper tool, are indicative of production and modification. The distribution of chert and obsidian flakes is even across the entire interior space of the house lot and densest in fill directly above the floors. This trend is echoed in the microdata: the floor in the far eastern area of the house was the densest in microlithic (F19.15.1.1; fig. 11). This confirms the production or maintenance of chipped stone tools within the interior household space as exhibited in the macrolithic distribution.

A single bone pin or needle and a ceramic token are all that remain to signify this household's role in any craft production and consumption. Likewise, there is little to suggest that the central pyrotechnic feature (what I have called an oven) was in fact a kiln, because only a single over-fired sherd and possible kiln stand were found in association. The stand could just as easily have been an andiron for supporting cooking vessels, just as the large charred mud brick inside the oven could have served as a ledge for the firing of new ceramic vessels. Equally enigmatic is an odd-shaped pit in the eastern portion of the building, which seems to be contemporaneous with occupation of the space. Minimal evidence for slag (most notably in microform) and the hard, reddish, compacted bottom of this pit point to possible metal smelting, although the possibility that these bits of microslag transferred off hammer stones or are naturally occurring in the soil should not be overlooked (Margaret Abraham, personal communication). It is also more likely that these slag bits derived from the breakdown of ceramic pieces or mud brick caused by the intense fire that caused the destruction of the building.

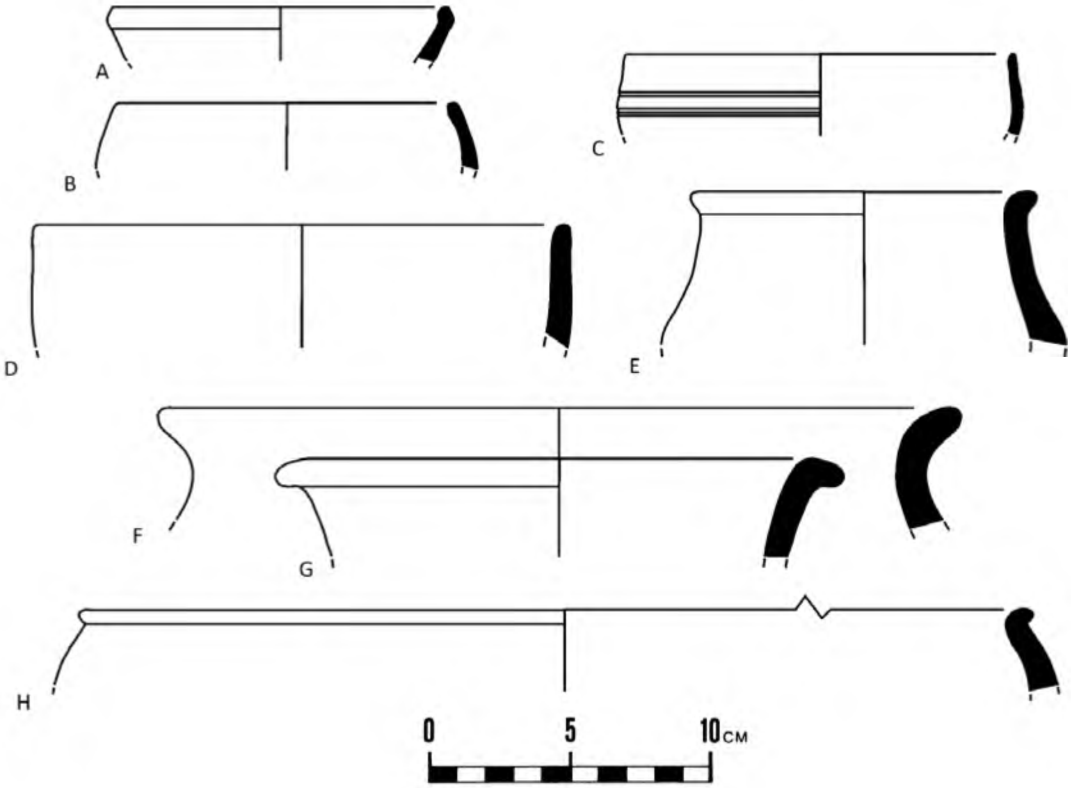
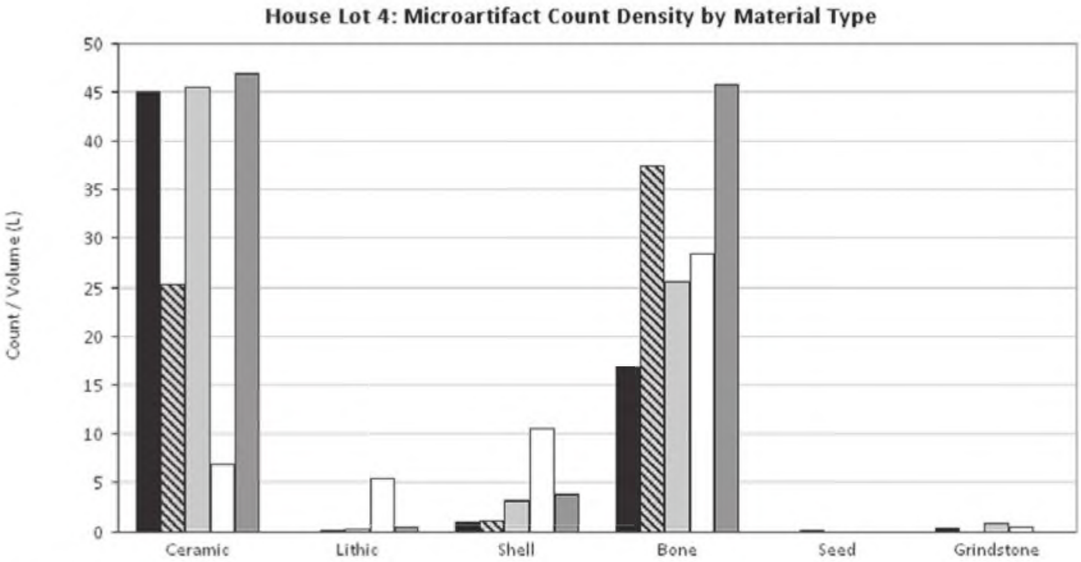


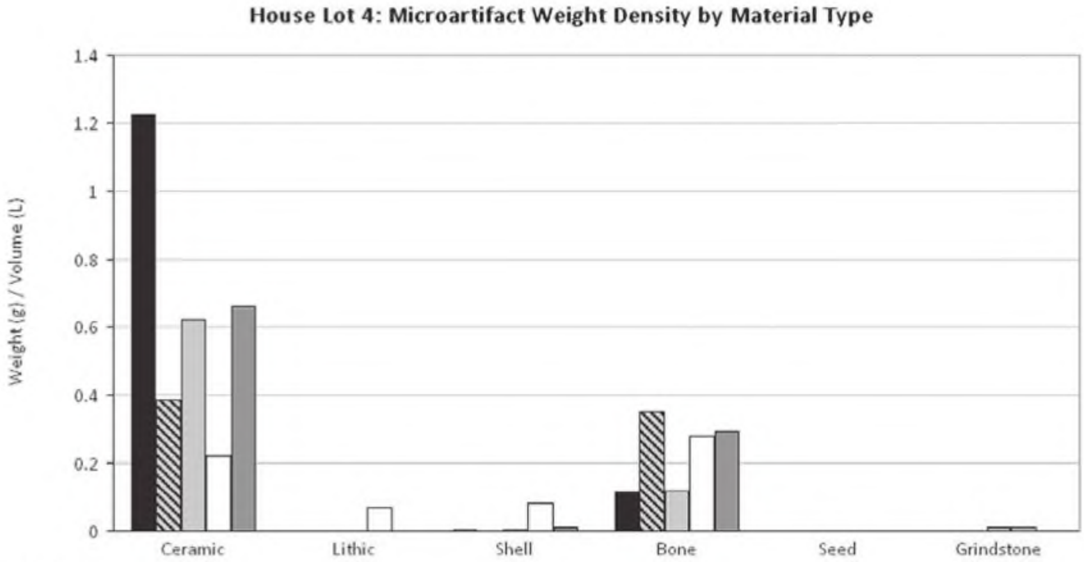
Fig. 10. Selection of ceramic vessel assemblage from House Lot 4 at Late Chalcolithic Kenan Tepe (courtesy of UTARP Digital Archive).

Finally, there is no explicit evidence for symbolic practice that mirrors objects such as figurines and miniature vessels from the other house lots. While the production and consumption of these types of objects as part of a symbolic system does not seem to have taken place (at least in a way that we can "see" archaeologically), this does not mean that the beliefs and spiritual practices of the household members did not manifest themselves in other, less material ways.

To conclude this brief examination of the evidence from House Lot 4, there is very little data to substantiate the extensive processing or consumption of cultivated plants by this household. They did, however, consume the meat of domestic and wild animals, including sheep, goats, cows, deer, and fish but relied primarily on pigs. These foods were likely cooked inside a large central oven/fire pit that was regularly cleaned. Along with food, the householders also produced and used chert and obsidian tools such as flakes, blades, and scrapers. Production and modification seems to have taken place throughout the house lot, which might be more an indication of relaxed cleaning habits than actual manufacturing distribution, although increased production does seem to have centered on the eastern (back) room of the building. Industries were quite minimal by this household group, as were tangible expressions of symbolic systems.


House Lot 4: Microartifact Count Density by Material Type

	Ceramic	Lithic	Shell	Bone	Seed	Grindstone
■ F19.14.1.1	45	0	1	16.8	0	0.4
▧ F19.14.2.1	25.27272727	0.181818182	1.090909091	37.45454545	0.181818182	0
▨ F19.15.2.1	45.55555556	0.222222222	3.111111111	25.55555556	0	0.888888889
□ F19.15.1.1	6.888888889	5.333333333	10.44444444	28.44444444	0	0.444444444
▩ F19.15.5.1	46.88888889	0.444444444	3.777777778	45.77777778	0	0


House Lot 4: Microartifact Weight Density by Material Type

	Ceramic	Lithic	Shell	Bone	Seed	Grindstone
■ F19.14.1.1	1.2246	0	0.002	0.1128	0	0.0016
▧ F19.14.2.1	0.385818182	0.000181818	0.000363636	0.352545455	0.000181818	0
▨ F19.15.2.1	0.622444444	0.000222222	0.004222222	0.118666667	0	0.009111111
□ F19.15.1.1	0.221111111	0.066444444	0.082	0.280888889	0	0.011555556
▩ F19.15.5.1	0.660888889	0.000444444	0.010444444	0.292666667	0	0

Fig. 11. Microartifact count and weight densities for House Lot 4 with most common material categories (ceramic, lithic, animal bone) and subcategories.

Households and the Uruk Phenomenon

As previously stated, understanding the ways households produce, exchange, and consume as part of a domestic economy is vital not only for distinguishing the basic structure of household groups but also for using this DMPC as a diachronic window into larger sociocultural change. For Late Chalcolithic Kenan Tepe, this change involved a shift in interregional relationships marked by the Uruk Phenomenon, which, regardless of the initial causes, sparked changes in settlement patterns, industries, and the general ways communities interacted both regionally and across Mesopotamia. How did these changes manifest themselves in non-elite households? Based on the available data from three households at Kenan Tepe, there appear to be common themes to the components that comprise the domestic economy that remain constant throughout its 300-year history. At the same time, there is also conspicuous absence of specific elements that comprise the DMPC, along with prominent changes between household groups that are indicative of greater socioeconomic trends.

These stable elements of the domestic economy that have been recovered archaeologically include chipped-stone tool production and consumption and the use of ceramics. Across all households, chert and obsidian tool production and consumption remained a primarily house-based operation, with chert being the more accessible and commonly used commodity. The level of obsidian consumption remained relatively constant, reflecting a continuous availability or access to this nonlocal resource through a regional trade network. Although the densities of microlithics are relatively low throughout, this is most likely a product of differential sampling as opposed to less-intense knapping activities. This type of production likely took place in open courtyards or alleyways where there was plenty of light, as seems to be the case for House Lot 3 and where admittedly there was less intense microsampling for this study. Finally, the consumption of ceramics was consistent throughout in terms of forms and fabrics that retain signature elements of a local tradition paralleled at other sites throughout eastern Anatolia and north Syria.[21]

The absence of certain industries and practices within the realm of these three house lots is particularly enlightening, especially because they comprise some component of domestic or community-wide economies at other Late Chalcolithic sites. Metals and metal-processing is one of these absent industries, despite the relative proximity of Kenan Tepe to the local copper mines of Ergani Madden and Siirt. Metals such as copper and tin are thought to be one of the primary raw materials sought by southern Mesopotamian Uruk colonists in their exploration of Greater Mesopotamia, an assertion that is largely supported by intense metal-working and finished products at major fourth-millennium sites such as Hacınebi, Brak, Sheikh Hassan, Jebel Aruda, Arslantepe, and Norşuntepe. This perceived lack of metal-working is perhaps one of the underlying reasons there is no evidence for direct contacts with a larger southern Mesopotamia Uruk network at Kenan, despite evidence to the contrary at neighboring sites.[22] Because metallurgy requires not only access to raw materials but also specialized knowledge (Yener 2000), it stands to reason that southern Mesopotamian entrepreneurs would enter into trading partnerships with those who already had an established tradition of this type of production.

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[21] A more in-depth treatment of the Late Chalcolithic ceramic assemblage from Kenan Tepe can be found in Creekmore 2007; Parker and Foster 2009.

[22] Beveled-rim bowls, one of the hallmarks of the Uruk Phenomenon, have been excavated at Aşağı Salat and Giricano (Schachner 2004; Şenyurt 2002) and recovered in regional surveys (Algaze

While ceramics were consistently consumed (e.g., used) by the Kenan households over time, there is no concrete evidence for their production at the household level. Almost all pyrotechnic installations associated with the various house lots were relatively clean, leaving no evidence for their use as kilns for firing vessels. This low visibility of ceramic production on the household level might signal that specialized production took place in workshops that remain to be excavated at Kenan or that ceramics were imported. This situation stands in contrast to neighboring sites such as Hacınebi, Hassek Höyük, and Arslantepe, where the presence of kiln wasters and unbaked bowls attest to on-site production (Frangipane and Balossi 2004; Helwing 1999; Stein 2002b).

Higher-level accounting and centralized storage and distribution of resources also seem to not have taken place within or cooperatively between the households under discussion. While the clay cylinder seal from House Lot 1 may emphasize at least the local emulation of foreign economic practices, the lack of sealings from this and other house lots undermines the possibility that this seal was used for accounting procedures. This does not, however, rule out its possible apotropaic or decorative use. Similarly, the recovery of a single ceramic token (or jeton) from House Lot 4, representing anything from an external symbolic storage unit (Costello 2000) to a counting device (Jasim and Oates 1986; Schmandt-Besserat 1992) or gaming piece, is not enough to extrapolate the kind of complex economic system that is better represented at other sites. Finally, there is no evidence that these households engaged in any kind of long-distance supraregional trade that would be manifested in raw materials such as bitumen and lapis or in non-local clays used for sealings (as at Hacınebi; see Blackman 1999; Pittman 1999; Schwartz et al. 1999).

In terms of diachronic shifts in the domestic economy at Kenan, the most significant changes are in the areas of craftsmanship and plant production and consumption. Chronologically, there is almost a total break in spinning and cloth production on the household level between House Lot 1 and House Lots 3 and 4. While spindle whorls, weights, needles, awls, and beads are plentiful throughout the multiple phases of occupation at House Lot 1, House Lots 2 and 3 contained only two beads and a single pin between them. Not only are these elements of production plentiful for the household of House Lot 1, the pattern of their deposition, in particular the vast majority of spindle whorls being grouped within the large oven, is intriguing. The whorls are tightly clustered into two groups that are separated by no more than 20 cm of debris, which signals that they were not likely the product of multiple episodes of deposition over an extended period of time.

Rather, it is more likely that these whorls were either used by multiple household groups and then trashed together in a communal dumping area inside the Phase 1 oven or that this depositional pattern reflects a type of cottage industry for spinning practiced by the householders of House Lot 1. The first interpretation requires additional evidence from house lots surrounding House Lot 1, which is currently

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1989b; Algaze et al. 1991). A baked clay wall mosaic cone, used to decorate public buildings in southern Mesopotamia, was also uncovered at Aşağı Salat (Şenyurt 2004).

unavailable. The second is not only supported by the sheer amount of whorls and other tools of the trade but also by the nature of one of the primary materials being spun: flax. The preparation of flax fibers for spinning is both time-consuming and complex, requiring certain expertise, knowledge and the use of specialized tools (Barber 1991; Forbes 1956). As noted by Keith (1998: 510), flax is thus unlikely to have been an occasional or minor spinning product.

There are several possible reasons for this pattern of declining spinning and textile production in the later households, including low archaeological visibility, a shift in production methods,[23] or the movement of this industry from a household-level activity to one that was centrally practiced and managed. Another hypothesis is that textiles were increasingly imported to the village from other polities in the upper Tigris or beyond. The last two of these possibilities reflect a non-self-sustaining or dependent household structure in terms of this type of production after 3300 B.C.E.

A second diachronic shift is in the area of plant cultivation, most notably cereals such as wheat and barley. House Lots 1 and 3 provided evidence for the processing and consumption of these cereals, while House Lot 4 was botanically bare. This pattern could be due to several factors, including varying pyrotechnic histories, the particular steps associated with crop production and processing, or sampling bias. It is clear, however, that House Lot 4 suffered a conflagration that led to its destruction, which would have fully charred and thus preserved any botanical remains present. Likewise, while it is acknowledged that the major procedures in plant cultivation such as sowing, harvesting, and threshing take place beyond the limits of house lot spaces, this does not account for the absence of herbs, nuts, and seeds derived from kitchen gardens or orchards that make up a portion of other household diets. It seems that the sampling procedure for House Lot 4 likely has much to do with these results, because the majority of samples were taken from surfaces, which are traditionally poor in botanical remains, especially if they are nonporous and hard-packed (Alexia Smith, personal communication).

This decrease in the level of plant-processing and consumption of staple cereals on the household level is coupled with a marked decrease in the level of fishing and overall usage of wild resources. At the same time, there are significant shifts in animal-rearing and consumption, from a strong preference for sheep and goats in House Lot 1 to a more diversified diet in House Lot 3 to a noticeable preference for and, I would argue, reliance on pigs in House Lot 4.[24] This could be the result of several factors, including environmental change and individual household decision-making based on specific economic circumstances. However, diet and the way that food is prepared are sensitive indicators of ethnic, cultural, and economic categories, especially because food practices tend to be conservative (Bigelow 1999; Crabtree 1990). While other data categories such as ceramics and chipped stone give no evidence for radical alterations in manufacturing techniques or styles that might indicate shifts in the ethnic or cultural make-up at Kenan, the switch to a largely meat-based diet dominated by pigs most likely reflects three scenarios.

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[23] In particular, a change in traditions to the adoption of hand-spinning or a hooked stick technique that require no spindle or perishable materials such as wood, would not be preserved in the archaeological record in this region of southeast Anatolia.

[24] I use the term "preference" to denote an increased ratio of pigs to cows, sheep, and goats, as opposed to increased amount. This is because there does not seem to be an intensification of pig-rearing over any other animal in this case.

First, seasonality or increased sedentarization are possible explanations for these shifts in the DMPC at Kenan Tepe, being marked by changes in textile production and inconsistencies in plant cultivation. As exemplified at Sos Höyük and Büyüktepe (Howell-Meurs 2001) and also seen at Kenan Tepe, both temporary and permanent architecture may be found together within a single settlement, representing the gradual sedentarization of nomadic portions of the population. Likewise, particular segments of society, most notably household groups, often move along a continuum between semipastoral and agricultural lifestyles or even remain in the middle where both are practiced simultaneously (Pollock 1992). However, due to the fragmentary nature of the archaeobotanical and faunal assemblages for each household, it is extremely difficult to distinguish markers of seasonality, like migratory bird species or wear stage scores for teeth, which would indicate the time of year animals were culled. Nevertheless, the diversity of domestic taxa across all households instead supports the supposition that Kenan Tepe hosted a primarily sedentary population throughout the Late Chalcolithic (Sarah Kansa, personal communication). This is further supported by the increased preference for pigs—animals that are especially ill-suited to a semipastoral life due to its high water needs, sensitivity to heat, and inherently difficult temperament (Grigson 2007; Horwitz 1989).

Economic degradation is a second possible explanation for change to the DMPC, especially since the primary industries of weaving and staple animal production can fluctuate based on economic realities. Suitable agricultural land and high labor inputs are necessary to sustain flax production (McCorriston 1997: 522). Thus, a change in climatic conditions or household organization could effectively alter this industry. However, there is currently no concrete evidence for drastic changes in precipitation levels or water output from the Tigris River or an intensification of caprine herding that would denote increased use of wool as the primary material of industry. Instead, it seems that the time and energy required to maintain domestic flax exceeded the capabilities of individual households, perhaps due to economic downturn.

Slumping economic conditions could also have led to a shift in diet involving an increased preference for swine. For smaller household groups that either lack or have minimal access to other food resources, pigs can play an important role in risk management and abatement strategies. They require minimal labor input and consume a wide variety of products, such as fruits and nuts, as well as garden clippings and even food scraps. Pigs convert 35% of the energy they receive from their feed into meat, while sheep only convert 13% and cattle even less (Harris 2007). Pigs also breed at a much higher rate then their barnyard neighbors, with a single pig able to birth eight or more piglets that can reach 400 pounds within 6 months. From an economic standpoint, pig-rearing is cheaper and easily manageable by smaller, independent household groups.

When comparing these conditions with significant activities and industries that are notably absent from these three household economies, such as storage, metallurgy, and ceramic production, an image of a relatively underdeveloped infrastructure at Late Chalcolithic Kenan Tepe emerges. That this infrastructure was further declining by the end of the fourth millennium is perhaps best reflected in a specialized diet that was easier to maintain. A focus on pigs could also underlie increasingly degraded environmental conditions not accounted for in the botanical records for the site and region, because increases in domestic pig consumption have been linked to over-hunting and habitat degradation (Zeder 1998).

While I am not suggesting that the situation at Kenan is necessarily echoed throughout the region, this unspecialized and relatively underdeveloped economic system may account for why the general impact of the Uruk Phenomenon was less intense in the upper Tigris, despite it being a zone rich in resources such as timber, metals, and water transportation. Likewise, if indeed exploitative economic exchanges were occurring, the degradation of domestic economies at Kenan could substantiate core–periphery models that favor the eventual economic deprivation of smaller village sites. However, this shift in diet at Kenan to pigs in particular reflects how isolated and self-sufficient the householders at Kenan truly were by the end of the fourth millennium, enough so that they were not integrated into any regional economy.[25]

What would cause this economic shift, not primarily tied to environmental degradation, at Kenan? My guess lies with the third scenario based on a more active, agent-centered view of the domestic economy, in which household groups were adjusting to site-wide and regional conditions. For example, it has been argued that textiles were a major item exported by southern Mesopotamian Uruk colonists serving not only as a mechanism for exchange with a wider interregional network (Algaze 2005) but also as the catalyst for a northward expansion to appropriate more pasture lands to sustain larger flocks (McCorriston 1997). Although a shift in the household production of textiles in both level of manufacture and raw materials is not evident in indigenous communities at sites such as Hacınebi or Arslantepe, it is for Kenan. If textiles were indeed a major product of trade, then the reduction of household-based production at Kenan during the height of the Uruk Phenomenon is notable and perhaps a result of the trend in which households were actively seeking outside sources, perhaps for a higher quality product.

Changes in wool production and pasturage also have much to do with animal husbandry practices. At contemporary Anatolian sites such as Arslantepe and Hacınebi, a dramatic increase in the ovicaprines with a simultaneous reduction in pig and cow populations during Uruk contact phases during the second half of the fourth millennium has been used as supporting evidence for the influx of either foreign peoples or foreign influence on diets and cultural traditions reminiscent of those in southern Mesopotamia. The subsequent return to "normal" husbandry patterns that evidently focused on cattle (along with sheep and goat) in areas north of the Taurus and pigs south of the mountains further confirms the intrusion of Uruk influence as populations supposedly returned to traditional lifeways at the collapse of this regional interaction system around 3000 B.C.E. (Siracusano 2002).

This theory is based on a correlation between pigs/cattle and indigenous populations as a cultural and/or ethnic marker partially substantiated by archaeological evidence at contact sites (Boessneck and von den Driesch 1975; Boessneck and Steger

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25. A similar trend is noted at Bronze Age Tel Halif, in Israel, where fluctuations between isolated and integrated economic patterns coincide with high and low levels of pig consumption on the non-elite household level (Zeder 1998).

1984; Grigson 2007; van den Driesch 1993; Redding 1981; Wattenmaker and Stein 1986; Vila 1998). However, two significant outliers to this trend are Hassek Höyük (Boessneck 1992) and the households from Kenan, where pig remained one of the major staple commodities, largely for meat, throughout the LC 5 to Early Bronze I transition. While this preference for pig at Hassek during the height of Uruk influence has been explained as a program of specialized breeding used in trade for primary elements of production (Frangipane and Palmieri 1987: 300), this is not a sufficient explanation for the data from Kenan. Even if textiles were being imported (see earlier discussion) and traded for specialty meat products, there is insubstantial evidence for a domestic industry of pig-rearing run by the household members at House Lot 4.

Instead, I contend that the preference for pig is less a result of economic degradation or ethnic marking and more a reaction to the controlled economic provisioning that was one of the hallmarks of the southern Mesopotamian Uruk administrative system. This system was based on pastoral animals—namely, sheep and goats—which can be centrally managed and controlled. The same cannot be said of the pig. Despite the economic advantages discussed previously, raising pigs can be a tricky business. They require high amounts of water and shade because their bodies cannot tolerate temperatures above 35 degrees Celsius (Grigson 2007: 98). Pigs cannot be herded or migrated long distances to take advantage of fresh pasture. They will also trample and uproot cereal grains if allowed to roam freely, thus necessitating the use of pens or close monitoring (Zeder 1991: 30–31). Despite these conditions, pigs are a highly sustainable meat source and ideal for risk-abatement strategies that are particularly suited for rural family and/or small-scale sty management, especially in arid and semiarid environments. This small-scale, non-elite management is further supported by archaic administrative texts of the late fourth and early third millennia in Mesopotamia that make almost no mention of pigs or pig-herding but instead focus on the care, management, and distribution of sheep, goats, cattle, and donkey. This trend seems to continue into the late third millennium, where at urban centers such as Tell Leilan, pigs comprise 50% of the faunal assemblage in lower town areas supposedly inhabited by poorer residents (Zeder 1998: 118).

I contend that pigs acted as a supplemental food source for non-elite household populations to balance out resources acquired through other channels, including (perhaps) centralized redistribution of products such as sheep and their wool for textiles. A heavier reliance on pigs could thus be seen as either indicating a disruption in the redistribution channels or as intentional undercutting of the elite administration through strategic household decision-making. While the existence of this administration at Kenan is not overt, a closer examination of the absent elements from the DMPC of House Lot 4—ceramics, plant cultivation, weaving—suggests that these industries were likely centralized, whether through specialized households or elite institutions. The lessening of ovicaprines over time might also be explained by a newly centralized management of sheep and goats and their secondary products.

A physical marker of more centralized management at late-fourth-millennium Kenan is the building of a monumental wall circumvallating the upper mound, coinciding chronologically with the householders of House Lot 4. The function of this 1.5-m-thick wall remains elusive because the relevant occupational levels inside the wall are buried deep within the mound. Despite this shortcoming, it is clear that the parties who built or financed this construction project had extensive control of resources and labor. For example, the use of multicolored mud bricks derived from four different clay sources likely represents multiple labor gangs or tribute payments (Parker et al. 2005). Thus, it appears that although resources were being applied to massive construction projects on one side of town, individual households were reinforcing and adapting their food-production and consumption strategies to underscore their self-sufficiency on the other side of town, most likely as a reaction to changing economic and political situations.

Conclusion

Over the last forty years, household archaeology has developed as an important subdiscipline of the greater archaeological endeavor, providing a productive and evocative means by which to study our human past. For fourth-millennium Mesopotamia and the Uruk Phenomenon, it provides a new avenue for accessing Late Chalcolithic domestic groups, with a focused examination of architecture and artifact patterning. At the same time, the focus on the household can also shed light on the larger conditions, circumstances, traditions, and decisions that comprised the everyday lives of people in the past.

The domestic economies seen during the Uruk Phenomenon provide an especially productive approach to the socioeconomic developments during this premier phase in ancient history precisely because domestic modes of production and consumption were both affected by and effected change in these large-scale processes As my examples drawn from the Inka Empire and third-millennium states in upper Mesopotamia show, shifts in the domestic organization of labor to accommodate evolving political demands are visible on the household level. Likewise, households are able to effect levels of craft production and determine market and/or cultural value of products based on consumption patterns.

The results of my analysis of three households at Kenan Tepe show consistencies, conspicuous absences, and prominent shifts in distinct elements of the domestic economy that highlight not only local diachronic conditions for these individual groups but also how they fit within the sociocultural conditions of the larger community both at Kenan and the upper Tigris region as a whole. Core elements of the DMPC such as chipped-stone technologies and ceramics remained at consistent levels across all house lots. Decreases in plant cultivation are best explained by sampling strategies and issues of preservation. The absence of metallurgy, ceramic production, and trade items underscores the likely centralization of these craft activities at specialist households outside the scope of this study or, as I argue, increased economic degradation. Devolving economic conditions are also reflected in the shifting levels of textile production, as linen became an economic burden and was replaced by wool, and finished products were supplied either by specialist households or through importation.

The impact of the Uruk Phenomenon on regional and local economic systems and social organization is perhaps best exemplified in the change of diet among nonelite households at Kenan. The gradual transition from the primary consumption of ovicaprines in House Lot 1 to a balance of domesticate animals in House Lot 3 to a greater reliance and/or preference for pigs by the end of the fourth millennium in House Lot 4 can be explained most adequately by socioeconomic changes. As increased centralization of resources, such as sheep/goats and their products, was becoming commonplace throughout greater Mesopotamia, households at Kenan seem to have been reorganizing their production and consumption patterns to accommodate and possibly subvert changing socioeconomic relations, underscoring a continued sense of independence that households were striving to maintain.

My goal has been to push scholarship to reconceptualize the Uruk Phenomenon neither by wholly discounting previous theoretical models nor choosing a model that "fits best" for Kenan Tepe. In this chapter, I demostrated how traditional approaches to the Uruk Phenomenon could benefit from the incorporation of household data, if only to highlight and distinguish the variety of sociocultural systems at play during the Late Chalcolithic. Further examinations of domestic economies at other sites within the Upper Tigris remain to be carried out, along with the comparison between village and larger regional polities throughout greater Mesopotamia. Finally, aspects of gender, class, and age need to be further incorporated into examinations of Uruk households, due to their potential for isolating the individuals who actually participated in the Uruk Phenomenon, people who could have included not just wealthy male entrepreneurs but also craft specialists such as female weavers or poor refugees of men, women, children, and elders.

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Household Continuity and Transformation in a Prehistoric Cypriot Village

David Frankel and Jennifer M. Webb

The small prehistoric village at Marki in central Cyprus was occupied from the beginning of the Early Bronze Age (about 2350 B.C.E.) to the middle years of the Middle Bronze Age (about 1850 B.C.E.). A decade of field research has exposed 2000 square m in one part of the site, providing evidence of household structure and development over some 500 years (Frankel and Webb 1996, 2006a). The sequence can be divided into nine phases of construction and use, showing a pattern of growth, development, and decline in the extent and density of buildings. In this essay, the approaches and concepts underlying the archaeological procedures used to explore this site are discussed, leading into a summary of the history of the village. Variability in house form and elements of continuity and transformation provide the basis for an exploration of dynamic adjustments at different scales, from individual domestic cycles to broader relationships. These observations allow insights into aspects of social organization and decision making within this community over many generations.

Adjusting the Focus

This discussion of a Bronze Age village in Cyprus, like all archaeological studies, draws on general principles of human behavior and relates them to a particular set of historical, technological, and environmental circumstances. These work in tandem, as analysis moves between the two poles of process and contingency. Similarly, our analyses operate at a number of scales of observation—spatially from regions to sites, areas within sites and individual households, and chronologically over centuries or, at our finest level of resolution, decades. Each set of observations and each scale of resolution permits or requires different modes of explanation. These are dependent on numerous factors, from initial processes of discard and site formation through subsequent natural and cultural transforms to the extent and style of excavation, documentation, and analysis. Each region, period, site, and site component, together with the array of material remains, also imposes its own constraints and provides its own opportunities for exploring aspects of past behavior. In this essay, we attempt to link these varied issues of material, method, process, and scale through the investigation of households at Marki. Our concern here is with households as both architectural entities and behavioral units. The data on which the following discussion is based are presented in detail in the primary publications of the site (Frankel and Webb 1996, 2006a) and elsewhere (Frankel and Webb 2006b; Webb 2002, 2009).

Historical Context

The structure and changing pattern of households at Marki cannot be divorced from an appreciation of their historical context. In the mid-third millennium B.C.E., a generation or so before the site was first settled, significant changes marking the transition from the Chalcolithic to the Bronze Age took place in Cyprus. The difference between these archaeologically defined periods is characterized by the introduction of a wide array of new types of material culture and associated technologies (Bolger 2007; Knapp 2008; Peltenburg 1996, 2007; Webb and Frankel 1999, 2007). These reflect numerous domestic habits and techniques, such as ways of handling babies, of processing and serving food, of burying the dead, of manufacturing textiles, pottery, and other artefacts, and of constructing houses. These new patterns of behavior argue for the appearance of a new and different community on the island with a distinct *habitus*—a different way of being in the world (Frankel 2000). Of most immediate relevance here is the introduction of new animals (notably cattle and donkeys) and new agricultural techniques, especially the ox-drawn plow. These allowed an expansion of population, no longer constrained by the limits on productivity imposed by simpler technologies, and a spread of settlement into areas of low rainfall and poorer soils, which had been unattractive to those living a Chalcolithic way of life. In addition, the development of metallurgy—specifically the mining and working of copper—transformed perceptions of the value of some previously irrelevant landscapes and created different opportunities and incentives for developing intersite and interregional relationships.

It is within this period of dynamic transformation that we can place the foundation of the settlement at Marki by a small population operating within the closely knit social network characteristic of the Philia culture, the name by which the earliest facies of the Cypriot Bronze Age is known (Webb and Frankel 1999). Our current understanding is that slightly older, somewhat larger villages were already well established and that the move to Marki, located in an area of relatively low agricultural productivity, was prompted by its proximity to copper sources in the northern foothills of the Troodos range. A broken stone mold for casting copper ingots, reused in the construction of one of the earliest walls excavated at the site, is one indication of this (Frankel and Webb 2006a: 215–17).

At Marki, as at other sites, the increased productivity instigated by plow-based agriculture and other components of the newly introduced Secondary Products package was associated with continual population expansion. Over the next four centuries, the population of this and other villages increased consistently. Some time after 1950 B.C.E., however, a decline set in and Marki was gradually abandoned. This history of foundation, growth, decline, and abandonment is central to understanding both behavior within the Marki community and the changing relationships between the inhabitants of Marki and those of neighboring villages.

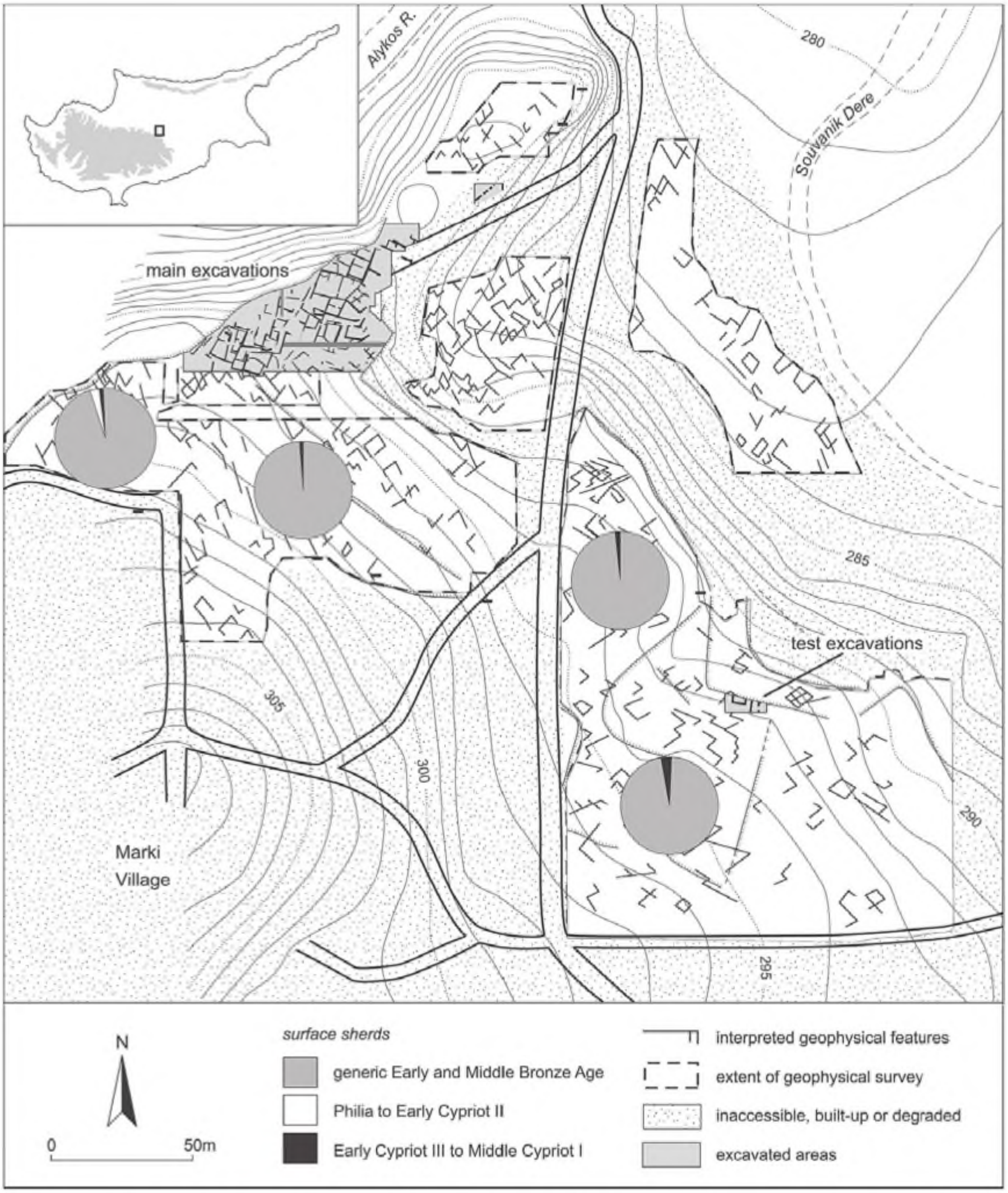
Alykos R.
280
Souvanik Dere
main excavations
285
test excavations
305
300
290
Marki
Village
295
N
0
50m
surface sherds
generic Early and Middle Bronze Age
Philia to Early Cypriot II
Early Cypriot III to Middle Cypriot I
interpreted geophysical features
extent of geophysical survey
inaccessible, built-up or degraded
excavated areas

Fig. 1. The archaeological site at Marki, showing the location of the excavations, geophysical indications of unexcavated buildings, and the surface distribution of chronologically diagnostic sherds.

Marki: The Site and Excavations

Marki is the most extensively excavated Early and Middle Bronze Age settlement in Cyprus and the only one to have produced well-stratified deposits from an occupation of some 500 years. The archaeological site is spread over 5 to 6 ha of gently

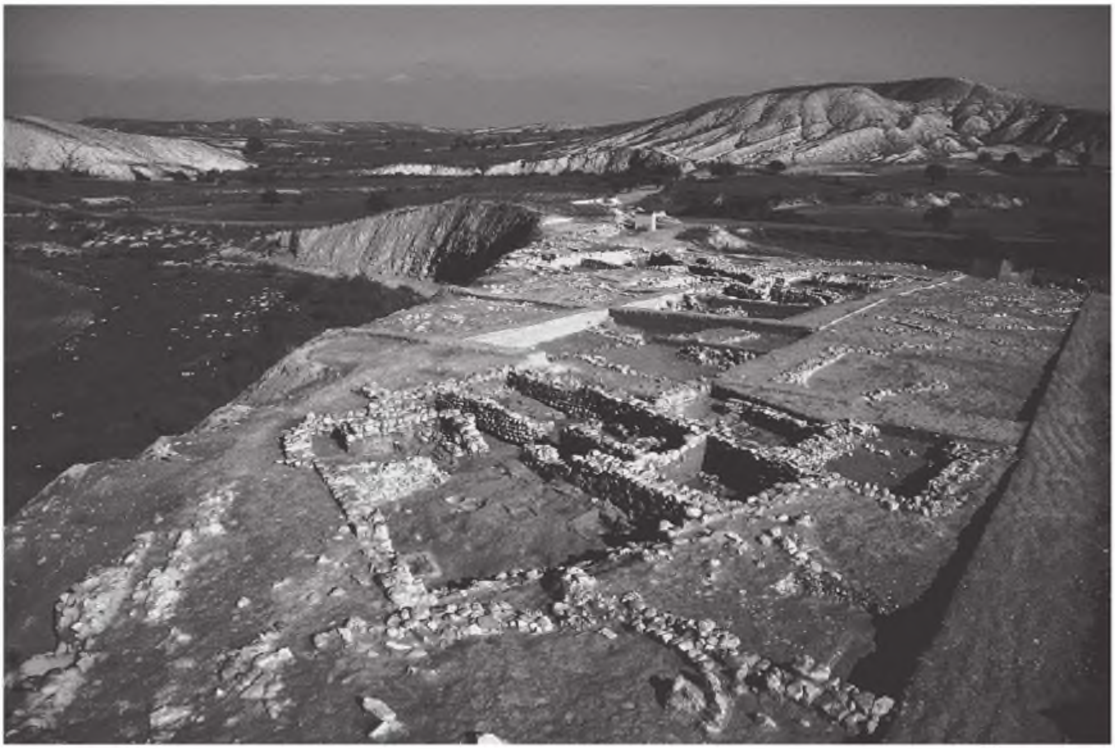

Fig. 2. The main area of excavations, showing walls of different periods. Compound 7 is in the foreground, with features of Phase H exposed.

sloping and flatter fields at the confluence of the Alykos River and its smaller tributary the Souvanik Dere (fig. 1). At no time, however, was all of this area in active use. As noted above, our view of the site is of an initial, small foundation toward the northwest of the settlement area. Here a combination of full-scale and test excavations, surface collection, and geophysical prospecting shows that housing gradually increased in density, before this part of the site was slowly abandoned as the focus of habitation shifted toward the south and east (Webb and Frankel 2004).

Our understanding of the site is structured by our fieldwork objectives, as well as by the nature of the surviving remains. Unlike many areas of the Near East, Cypriot sites tend to be relatively short-lived, are often unconstrained by town or city walls, and spread horizontally rather than building up into high mounds. This expectation of the site and its potential for broad areal excavation influenced our initial research design, which was aimed at examining synchronous patterns of social interaction between households, especially through an examination of the decorated pottery of the Middle Bronze Age. Practical considerations, including the timing and other demands of applications for funding, saw the development of a strategy involving a concentration on the northwestern area, where the archaeological material was less deeply buried (fig. 2). It was only after several seasons of fieldwork that earlier deposits began to be clearly perceived, adding a new dimension to the project by providing an opportunity to trace the history of this part of the site over half a millennium.

Our first major report, fully compiling the results of the first four years of work, was seen as a necessary stage in demonstrating the potential of approaches and finds, justifying further excavation to ourselves as much as to funding bodies (Frankel and Webb 1996). At that time, it was not possible to identify a clear sequence of architectural development, but patterns of discard, both incidental and deliberate, led us to construct a specific model of site-formation. This involved separating out material from a defined set of sources, which reflect varied pathways by which material entered the archaeological context. These differ in integrity and duration, ranging from short-term, high-integrity assemblages associated with the final use and abandonment of buildings to construction fill, which includes chronologically mixed discard of varied origin (Frankel 1998; Webb 2006).

The more extensive area and greater depth of excavation over the later seasons of fieldwork provided the basis for a more conventional division of the site into the major phases of development reported in our final volume (Frankel and Webb 2006a). The complex history of fieldwork, however, meant that while sequences of construction, use, demolition, and rebuilding could be traced in specific places, we could not see the development of the site as a whole until after the excavations had finished. The integration of disparate information was only achieved through post-excavation analysis of architecture coupled with the construction of numerous localized stratigraphic sequences, each made up of numerous episodes of different significance and integrity. A key part of our post-excavation analysis thus involved the definition of different architectural developments and depositional environments and events, including construction, renovation, refurbishment, and abandonment. Not all sequences are fully complete, especially where the demolition of earlier buildings or major restructuring and renovation (typically of courtyard spaces) involved the wholesale removal of considerable quantities of deposit or in cases where older walls were entirely removed.

Once we established, to our own satisfaction, nine broad-scale site-wide phases, their plans revealed a new and unexpected pattern of architectural form that allowed us to identify discrete units. This provided a significantly different understanding of houses, households, and site history from our original expectations, which had been based on limited exposures within the few previously excavated contemporary settlements (Webb 2009). These phase plans became the basis of our further analysis and explanation of the social history of the village. We are under no illusion that they capture synchronous events or reflect structures and developments within the lifetime of any one individual. While they remain idealized time-transgressive models, however, they are at a relatively fine temporal resolution (of, perhaps, no more than two to three generations) and can be used to develop useful insights into the history and behavior of particular households and the village as a whole.

Field Recording

The principles of field analysis used at Marki derive directly from our overall understanding of site-formation and were designed to distinguish excavated deposits with regard to their degree of integrity and association (Frankel and Webb 1996; Frankel 1998; Webb 2006). All positive (and negative) residues were identified as "contexts," including walls, pits, and other features as well as sediments. At a first level, the latter were defined as having primary and secondary integrity. Primary depositional contexts are those where material was deliberately placed or discarded as sediment accumulated and remained without later disturbance. Within these parameters, a key issue was the identification of use and abandonment contexts and the further separation of use or systemic contexts from abandonment surfaces (Schiffer 1972, 1976). Given the nature of house construction and processes of gradual abandonment typical of all phases of occupation at Marki, the identification of material in systemic as opposed to post-abandonment contexts was often problematic. In general, however, such material was considered to have a high degree of integrity and association with original or immediate post-abandonment use of the structures in which it was found.

Contexts in which sediments or/and artefacts had been removed from their original location of manufacture, use, or discard and redeposited were identified as secondary (or tertiary) depositional contexts. These include fill, dump, demolition, and rebuilding episodes, all of which involve the disarticulation of artefacts from primary depositional contexts. Artefacts recovered in secondary or tertiary deposition are likely to have low chronological integrity and little or no association with each other or with original activity areas. Fill deposits, for example, may combine material from all earlier phases of occupation, including that in areas beyond the excavated exposure, and a variety of initially unrelated contexts.

The basic spatial unit of stratigraphic analysis was the individual room, yard, passageway, lane, or enclosed space. This accorded each structural unit an independent history of construction, use, and abandonment and allowed identification of specific, localized, and small-scale activities. At the finest level, this was understood in terms of a series of events and episodes. Events are identifiable short-term activities, such as the construction or collapse of a wall, reflooring, or reorientation. At the next level, related events were subsumed into an episode. Episodes are thus palimpsests of specific events and usually the smallest meaningful analytical unit. Most are construction or use and abandonment episodes. Construction episodes may involve demolition, rebuilding, and accidental or deliberate fill. Use and abandonment episodes are floor and immediate above-floor deposits. A final level of stratigraphic analysis combined groups of construction episodes within and between architectural units into our nine main phases.

In our final publication, stratigraphic analyses were presented using Harris matrices. These were developed during excavation but substantially revised afterward. They provide a diagrammatic impression of relationships between contexts and the grouping of contexts into episodes and phases within each unit and were the principal analytical framework used in all subsequent discussions of depositional integrity, building history, and chronology. In combination with a single-context recording system, they present the history of the site as a palimpsest of discrete events in which contexts of removal and deposition are equally visible.

The ascription of excavation contexts to events, events to episodes, and episodes to phases involved a series of increasingly complex analytical abstractions. Much of this took place after excavation in conjunction with broader-scale analyses of architectural sequences. The field recording system, designed to provide maximum flexibility within the bounds of efficiency, allowed us, during post-excavation analysis, to lump contexts into behaviorally significant episodes within each architectural unit and attribute finds to specific types of deposition. This in turn allowed us to assess the relative chronological and systemic integrity of deposits and to look for meaningful links between consumption behavior, disposal strategies, and recovery contexts.

All archaeological fieldwork involves a complex negotiation between ideals and practical reality and is affected by attitudes, resources, aims, and abilities. Our primary strategies and aims at Marki did not involve the systematic sampling of deposits for tiny sherds, microdebitage or other forms of microartifact. While such analyses might have been useful in identifying fine-scale activity areas and varied depositional environments, many taphonomic processes, from the major cultural transformations of renovation, demolition, and construction to the finer-scale movement and mixing of material in standing ruins, may have seriously affected the success of these techniques. Nevertheless, the varied density of microdiscard in different layers or the identification of spatial distribution patterns may have provided an independent base for examining aspects of room or household forms and functions. At Marki, activities and activity areas were, alternatively, explored by contextual analysis of *de facto* refuse and built-in features (Schiffer 1976: 33; Webb 2006).

Site Formation Processes and Curate/Discard Strategies

Abandonment processes lie at the heart of any understanding of site formation. At Marki, there is no evidence for localized catastrophic events or sudden site-wide abandonment. Instead, our view is of a continual process of change as individual rooms or areas were renovated, reorganized, rebuilt, demolished, or left as standing ruins. During the course of excavation and in later analysis, we took care to identify different contexts of deposition and discard in order to understand the relationship of architectural units, features, and finds to one another. Each of the nine broad phases identified at the site can be understood as having two main components: episodes of construction and episodes of use and abandonment. Within this, a number of different formation or depositional contexts can be defined, including construction, renovation, use and abandonment, collapse, and other disturbance. The finds within each of these depositional envelopes have, naturally, varied degrees of chronological and behavioral integrity, association, and significance. While there were some instances of complete pottery vessels and other items in primary abandonment contexts (thus comprising a subset of original systemic inventories), most finds at Marki, as at other sites, represent secondary or even tertiary deposition (Webb 1995).

In the main, it is only the latest or final use and abandonment episodes that preserve assemblages closely related to room or area function and activity. Here the distinction between *de facto* refuse, left at the position of last use, and normal refuse, discarded onto middens or the floors or accumulation surfaces of abandoned buildings or open spaces becomes critical. One useful insight into the distinction between these contexts is provided by the ground-stone tools. Although often consigned a lower place within analyses and publications, these artefacts have considerable value for understanding assemblage structure and identifying activity areas and other aspects of consumer behavior. In this respect, the distinction between expedient and curated tools is particularly useful (Frankel and Webb 2006a: 197–248; Webb 1998, 2000, 2006). Curated tools are those that were formally shaped prior to use, maintained, or/and reworked and retained, as a general rule, until exhausted or broken. These tools have specific task-oriented features, such as sharp edges, perforations, or grinding surfaces, the production of which involved a time and energy cost that was recouped by long-term use and recycling. Expedient strategies, on the other hand, were a response to more immediate needs and involved minimal preparatory effort. Expedient tools are recognizable in most lithic assemblages as unmodified hand-sized pebbles used for a variety of tasks. Few show intensive use and most were acquired and discarded opportunistically.

Behavioral strategies associated with curation, expediency, and recycling played a significant role in determining the use trajectory and depositional history of stone artefacts at Marki (fig. 3a and 3b). Most curated tools were maintained for the duration of their use-life or recycled to other tasks. They are likely to have spent longer periods of time in systemic contexts, to have been used in multiple activity areas prior to final deposition, and to have been discarded in or near their context of final use when damaged, broken, near exhausted, or exhausted (i.e., as normal refuse). They are, therefore, less sensitive as fine-scale chronological indicators and more likely to be absent from, rather than present in, residual artifact assemblages. Expedient tools, conversely, were typically discarded after a relatively short use-life while still intact (i.e., as *de facto* refuse) at or near their location of original use. Expedient tools are, therefore, likely to have been associated with single or short duration events and may be expected to be sensitive indicators of moments in archaeological time and of use rather than disposal contexts.

Recognition of these and other normative patterns of consumption allows the identification of anomalous depositional behavior, with important implications for understanding the evidential value of specific artefacts. Both require an understanding of the mechanisms of site-formation and systemic inventory depletion, which are responsible for generating much of the variability within the archaeological record.

Buildings, Features, and Spaces

Buildings at Marki were constructed of mold-made mud bricks laid on lower courses of stones collected, for the most part, from the nearby river bed or surrounding hills. Elsewhere, contemporary sites show less evidence of the use of mud brick, especially where there was less available raw material or more abundant stone (Coleman et al. 1996; Swiny et al. 2003). So far as we can tell, buildings were only one storey in height. Mud-brick buildings typically require constant maintenance and frequent repair. Every so often, more extensive episodes of construction took place, as walls were built entirely anew. New walls for the most part retained the same orientation as their predecessors and nearby standing structures, and more often than not were built immediately above or slightly offset but still partially on top of the stone stumps of the demolished walls (fig. 4). In these cases all, or all but one or two courses, of the old mud-brick masonry was cleared away or spread out as subfloor leveling fill, running up to the stone courses of the replacement wall.

Internal features include several types of built-in installations, the most common of which were deep conical emplacements dug into the floors and lined with a thick concrete-like packing of small pebbles in clay or plaster. These may have

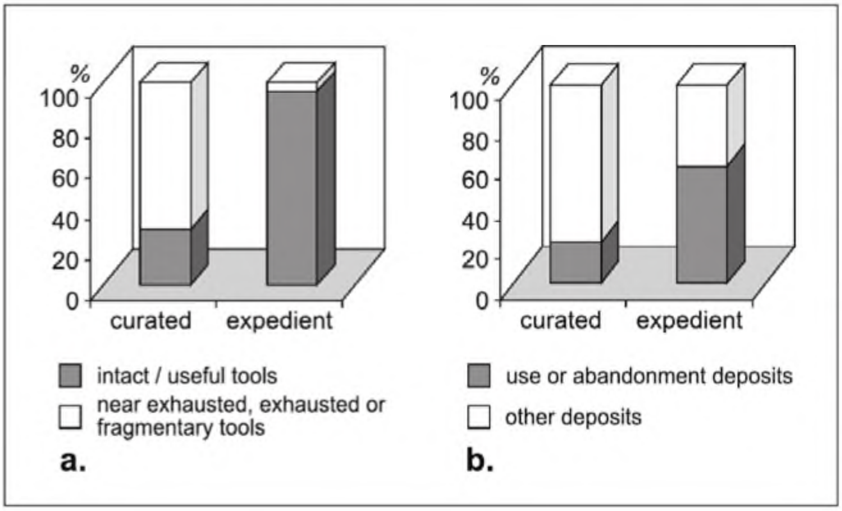

Fig. 3. Patterns of discard.
a. Incidence of intact versus exhausted, near exhausted and fragmentary curated and expedient ground stone tools
b. Incidence of intact curated and expedient ground stone tools from use and abandonment deposits.

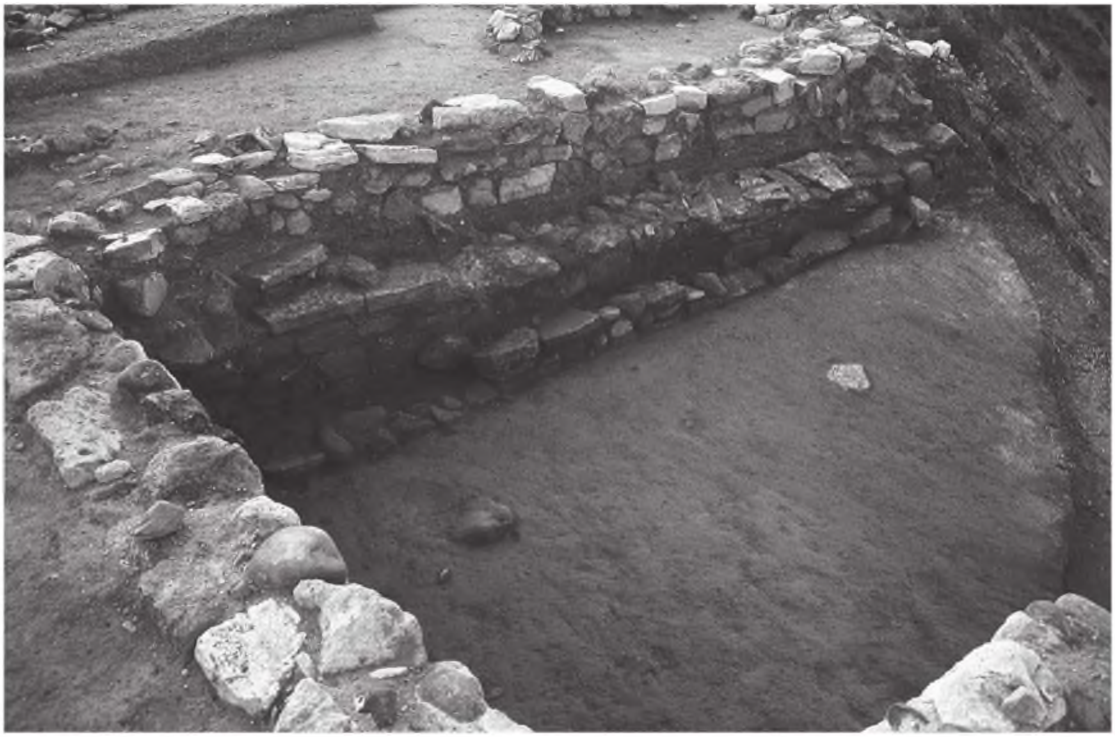

Fig. 4. Three superimposed walls showing continuity of building location and alignment.

been used as holders for large storage jars or possibly as floor mortars or for other purposes. Narrow, low, plastered benches were sometimes set along walls, often in conjunction with hearths with circular or square fenders made of similar materials. A few examples of small mud-brick or stone-lined storage bins and rectangular clay ovens also survive (fig. 5).

Floors were made of hard-packed mud, which often could not be distinguished from underlying leveling fill or overlying layers of post-abandonment sediment

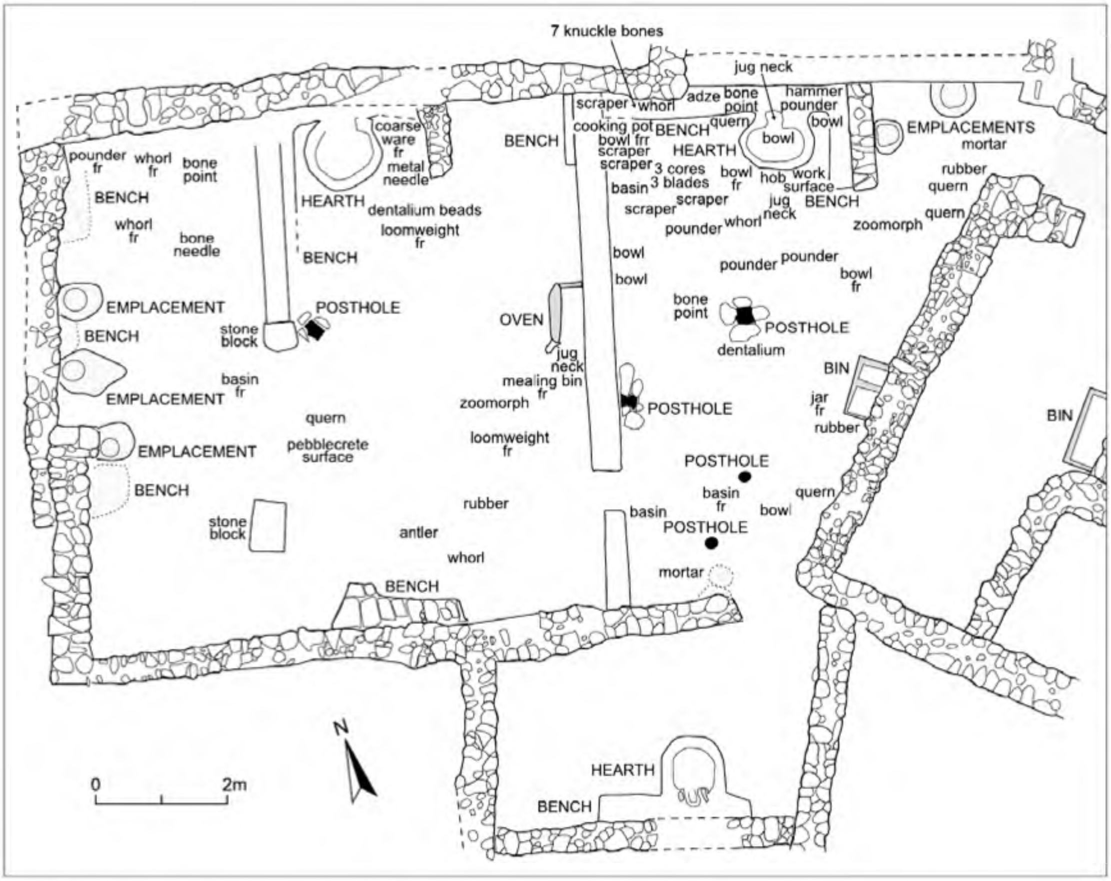

Fig. 5. Plan of Compound 29, Phase G with associated features and artifacts.

eroding and accumulating as walls and roofs collapsed, washed in, and decomposed. Where they could be traced as relatively smooth, harder surfaces, they were often sloping and uneven, both due to varied packing and wear during use and the effects of natural post-abandonment processes. The latter include the invasion of weeds, which broke up deposits, and the effects of rainwater, creating gullies or pools within standing ruins.

Although we could not see patterning in room form or features during the course of excavation, the phase plans revealed consistent architectural systems and structures that led to the identification of units as interior or open spaces and the grouping of sets of units into compounds. In total, 33 compounds were identified, most comprised of two or more covered rooms set within a partly or fully enclosed courtyard. Other types of space alongside the compounds could also be recognized, including access routes, general open space, and standing ruins.

We made use of different criteria working in combination to define each of these types of space. For example, from a structural point of view, interior spaces—especially the larger rooms—often have central posts to support the roof, are more likely to have smooth, hard-packed floor surfaces, include benches and hearths, and have emplacements along the walls. In contrast, the larger, open courtyards lack most of

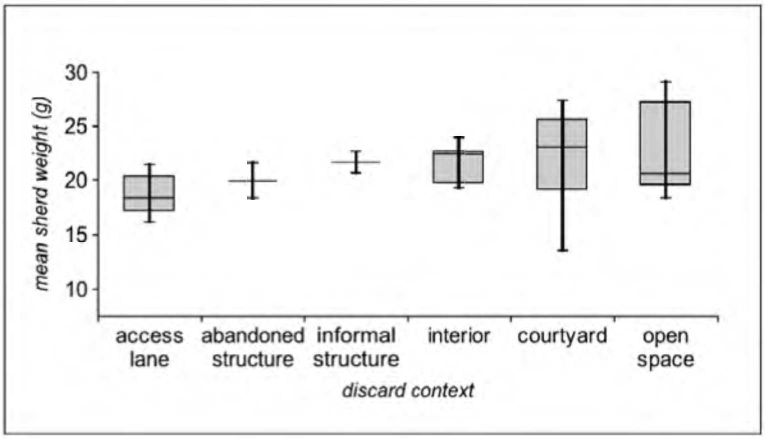

Fig. 6. Relative sizes of sherds in different spatial areas.

these features, while emplacements tend to be spread across the area rather than set along the sides. Additional support for our identification of these spatial forms is illustrated in fig. 6, where the nature of the original discard, coupled with later trampling and breakage, results in differences in the degree of fragmentation of sherds. Courtyards are also more likely to have suffered from episodes of major soil removal. The extent of this aspect of cultural transformation is well illustrated by the deep, solid floor emplacements. In many cases, only the lowest sections of these features survive, indicating the removal of some 30 to 40 cm of sediment.

Compound Variability and Social Relations

The general phase plans reveal architectural units which, as noted above, can be grouped into defined compounds. These vary considerably in size and composition. Some have courtyards, others do not; some have several interior rooms, others only one or two; some were short-lived, others lasted through many generations, albeit with internal changes and restructuring (figs. 7 and 8). However, within this wide array of forms there are some common general principles. All compounds were entered through the courtyard, either directly from open space or a public access route or in a few cases through a private passageway. Interior rooms in most cases led one from another, providing increased privacy with access depth. Hearths, wall benches and bins were exclusively located in inner rooms. Ovens, built in the courtyard in the earliest phases, are regularly present in interior rooms from Phase C onward and internal screen walls appear, apparently to conceal hearths from exterior view (these features are best seen in the well-preserved Compound 29 shown in fig. 5). Small sheds and animal pens, also located in courtyards in Phases B and C, are not obviously present from Phase D onward. The dense clusters of emplacements, which are one of the most characteristic features of courtyards, also decrease in number through time and were at times relocated to inner rooms. Alongside these developments, interior space was progressively subdivided and there was an increased reliance on prescriptive access routes.

The reduction in the number and variety of tasks carried out in courtyards is matched by a decrease in courtyard size through time and the development of compounds without courtyards (see Frankel and Webb 2006a, 2006b; Webb 2009).

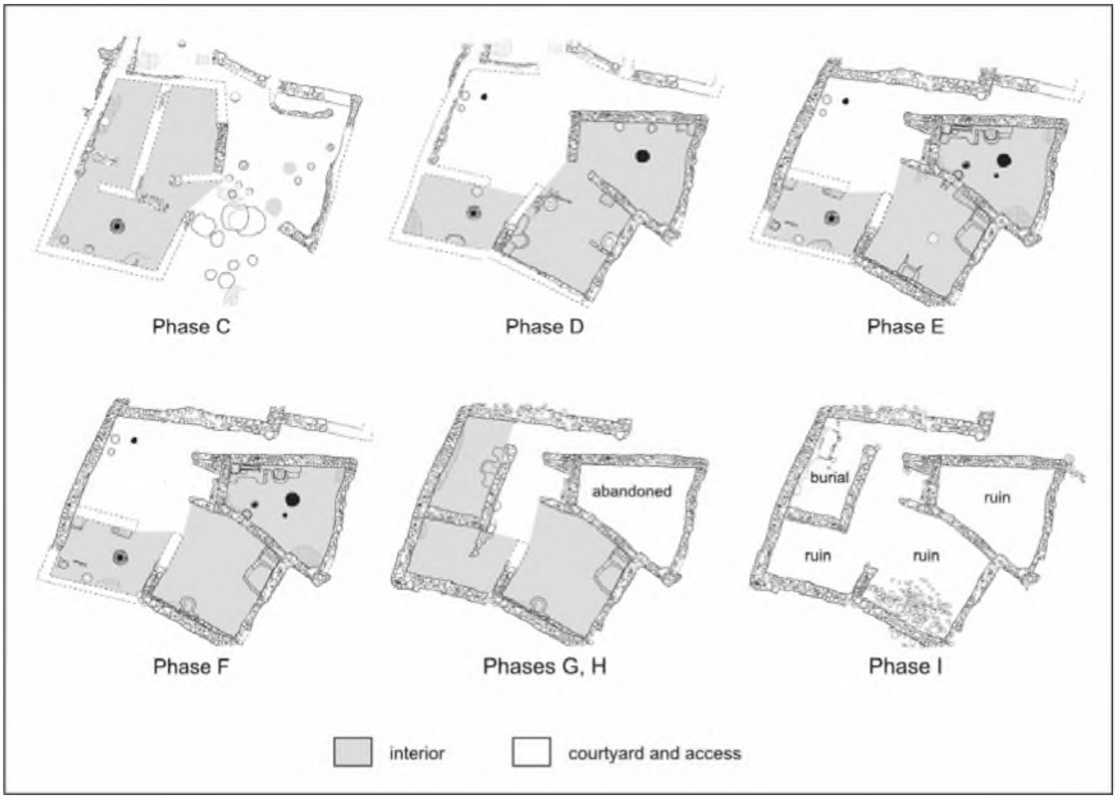

Fig. 7. Internal changes within Compound 6, from first establishment in Phase C to abandonment in Phase I.

The decrease in the importance of courtyards and the changing nature of courtyard activities suggest that some tasks performed there in initial phases were either no longer carried out or moved to other locations. It appears that by Phase D not all households were engaged in the same set of production and maintenance tasks. This implies an increasing degree of economic specialization and a greater diversity of household types, perhaps directly related to the increased population in the village. It is worth noting, however, that the longest-lived house compounds (6 and 7) maintained the full or near full extent of their courtyards and that households without courtyards were in all instances either newly established or a result of the breakup of earlier households. The emergence of some households without courtyards in Early Cypriot II (about 2300–2100 B.C.E.) may also signify an increasing differentiation in land ownership through time. Some households perhaps continued to own land, while families without land engaged in more specialized activities, in which case the latter may have provided a market for the surplus produce of the former and a source of seasonal labor. This situation is likely to have led to an increasing divergence of household activities and to changing and increasingly complex relationships between households. These structural changes may also reflect an increasing need or desire for inter-household privacy and security, perhaps linked with a growing emphasis on private property, intergenerational inheritance, and the control and manipulation of space and other resources.

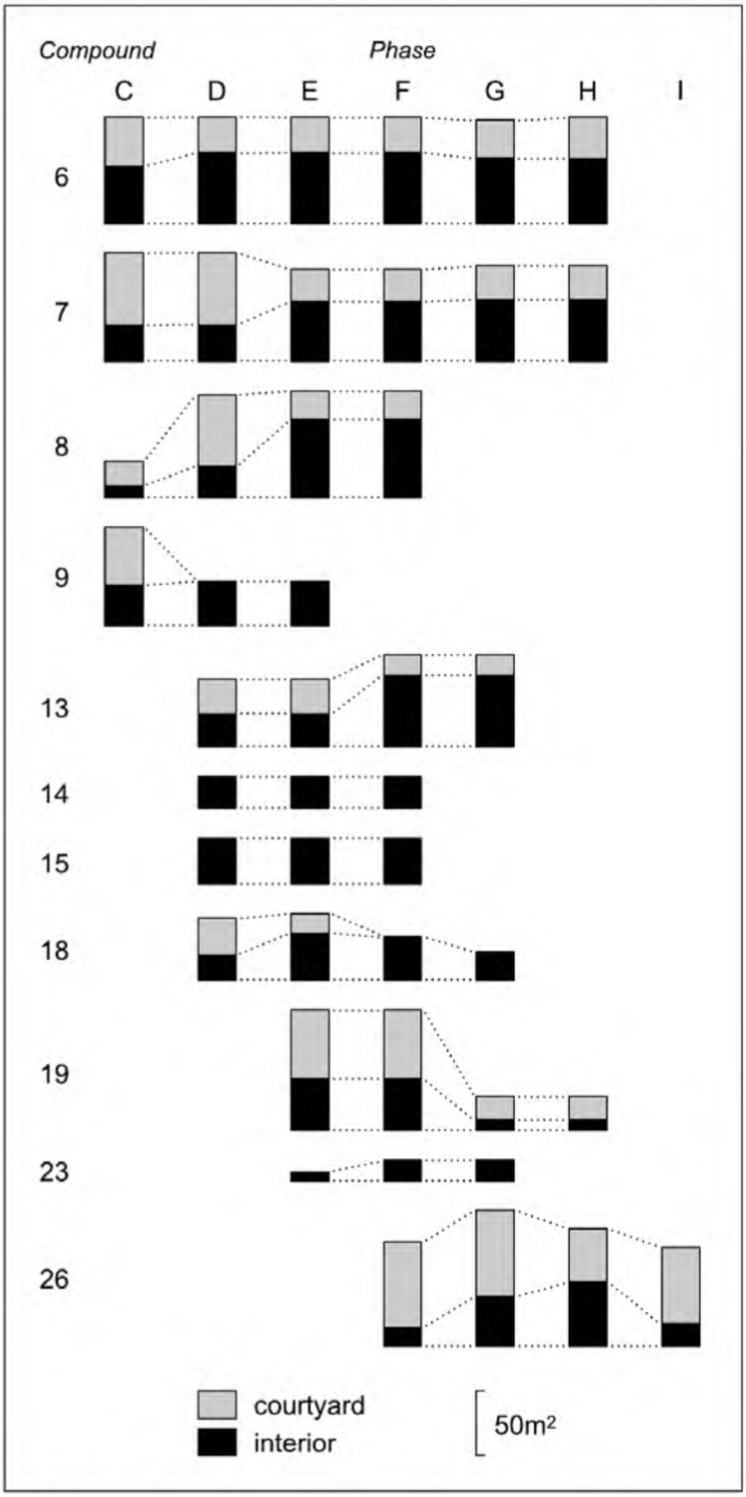

Fig. 8. The varied size, structure, and longevity of selected compounds.

In each compound, at least one interior room was furnished with a hearth with a semicircular or rectangular plaster fender, set against a low bench. In earlier phases households were typically furnished with one hearth room; later, two or three are more common. This changing internal organization of compounds is likely to be

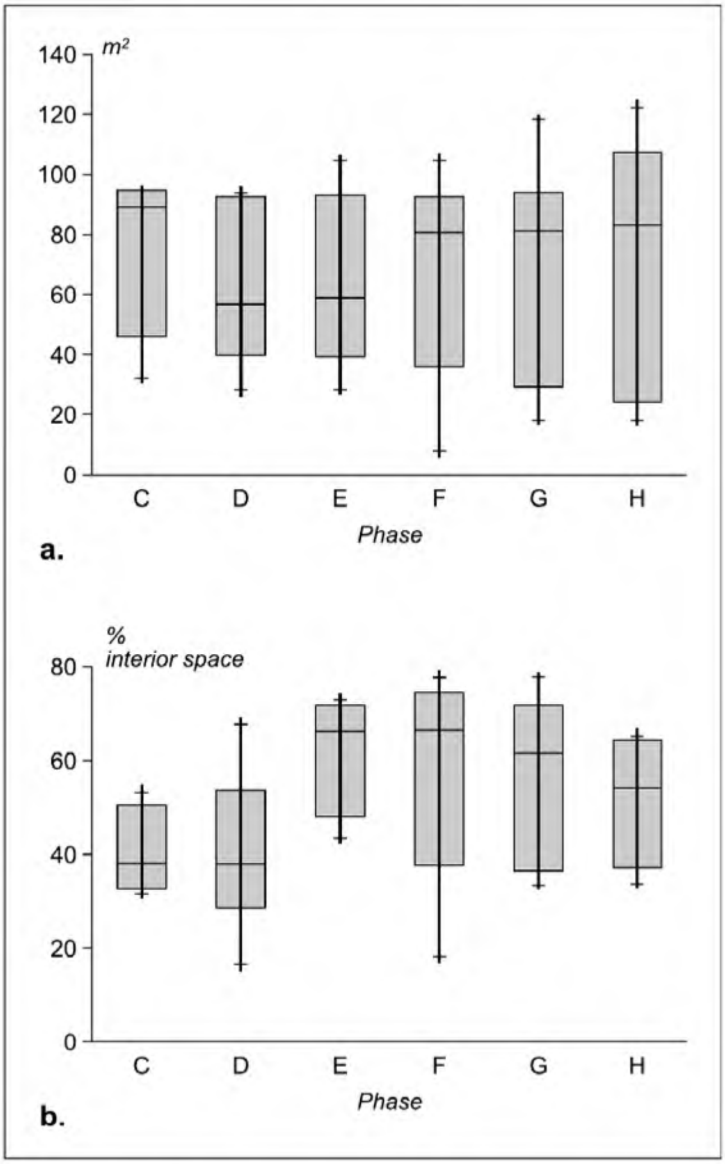

Fig. 9. Changing average size and variability of compounds through time.
a. Overall size.
b. Proportion of courtyard to interior space.

related to straightforward developments in the size and structure of residential units. The distribution of artefacts suggests that processing and small-scale storage of cereals and other commodities, spinning and weaving, chipped and ground-stone tool production, and perhaps wood and hide-working were routinely carried out in hearth rooms, along with food preparation, serving, and consumption (Frankel and Webb 1996, 2006a). Other interior spaces were probably reserved for storage and sleeping, at least during the winter. During the long, dry Mediterranean summer, more activities may have taken place outdoors and on rooftops.

There is a tendency toward greater variability in compound size through time, but this was relatively minor compared with the general uniformity of compound size and structure, with most occupying between 60 and 80 square m (fig. 9a). Similarly, while there is some variation in the number and size of facilities and rooms, there is nothing in the nature of the internal fittings or discard residues to suggest significant differences in economic capacity and storage. None of the compounds were substantially larger or better built than others, and no systemic differences in household function or in the wealth and status of the occupants can be identified. Individual compounds had their own histories (discussed later) but there were, over time, some general trends in the organization of space. In the middle phases, a higher proportion of compound area was devoted to interior rooms, with a slight reversion to the earlier pattern of more courtyard or open space in the later periods (fig. 9b).

The definition of compounds and the understanding of architectural components within them provide, together with the finds, the basis for understanding the nature of society and economy at Marki. The history of this village, growing from a small founder population to a substantial settlement of several hundred people, probably mirrored that of similar villages across the island. While these no doubt varied in size and density, depending on individual histories, location, and resources, few are likely to have been significantly larger than others. In common, also, with other villages of the period in Cyprus, the people of Marki based their livelihood on a broad-spectrum agricultural strategy, with an emphasis on cereals such as wheat and barley. Sheep and goats were herded for meat, milk, and wool. Cattle contributed both primary and secondary products and were important both symbolically and practically in farm work. Donkeys, too, allowed heavy loads to be transported.

Within this predominantly rural economy, other materials and products served to link communities in different ways: these relationships evolved through time. The small founding populations of communities like Marki are unlikely to have been viable as biological populations or large enough to ensure the transmission of craft skills and specialized technologies. They were therefore dependent on others for exchanges of people and goods. Its proximity to copper sources in the foothills of the Troodos and the presence of molds for casting ingots suggests that Marki probably served as a base for the distribution of copper in return for other products, including pottery (Frankel and Webb 2006a: 215–17). Later, as the population of this village expanded, there may no longer have been the same imperatives for exogamous marriage partners. We can identify a contemporaneous increase in local craft production, especially of pottery. Even so, kinship through intermarriage probably still served as the primary mechanism linking villages and facilitating the flow of goods and concepts.

The broad-scale evolution of patterns of relationship and interaction between villages was matched by equivalent changes within the community itself. Fig. 10 gives two views of the changing nature of the built environment in the excavated area at Marki. There was a gradual increase in the amount of enclosed space, with a concomitant reduction in open, presumably communal areas. By Phase D, the increased density of housing made it necessary to create lanes to provide access to houses and across the area. As the site continued to evolve, some buildings went out of use, remaining as standing ruins before either reverting to open space or being reincorporated into new or renovated compounds.

These changes have social implications. During the first century or two of its existence, the population would have been small enough, and the size and structure of the settlement open enough, for regular if not daily interaction between people. With the expansion of population, the increased density of built-up areas and associated

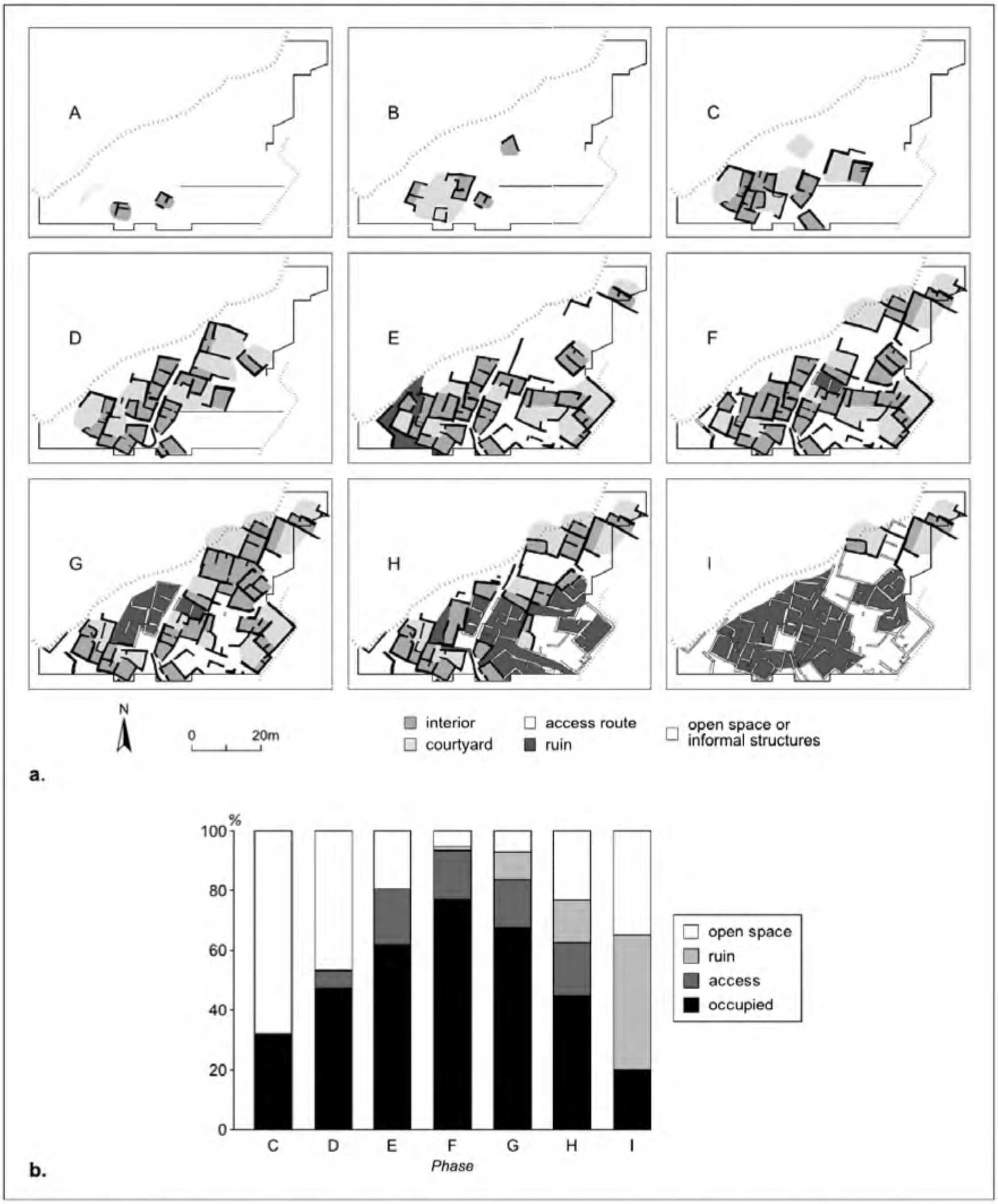

Fig. 10. a. The changing structure of the built environment in the excavated area. b. The relative proportion of the excavated area taken up by different types of space in successive phases.

barriers to sight and movement, this would no longer have been the case. Although significant regular contact would have been maintained within local neighborhoods, there is likely to have been relatively little communication with people from the other side of the village. Different forms of communal decision-making may have been developed, but at no time is there evidence for centralized authority or institutionalized control of wealth and political power.

From Architecture to Family and Gender

The changing size and increasing variety of compounds are one consequence of an evolving community, as the specific structure of individual households moved through cycles of expansion and contraction. Locating people, both at the individual and household level, within this physical landscape is, of course, difficult (Webb 2002). Nevertheless, as our focus moves from broad trends to more detailed discussion, we may make a significant shift in our language and understanding: moving from the more neutral architectural form, "compounds," to the more social, "households," and thence to discussing individual "families."

The spatial patterning and co-occurrence of facilities, together with the distribution of residual artefacts, provide an important indication of the range of domestic tasks carried out within compounds. From Phase D onward, these are characterized by the widely distributed, small-scale, private domestic storage of foodstuffs, typically in storage jars set in the floor emplacements or in three-sided rectangular bins. Emplacements are commonly located in discrete rows along walls in rooms without hearths. Rectangular bins, on the other hand, are consistently associated with hearths and may have provided short-term storage for more immediate needs. There is no evidence for communal, supra-household or external storage facilities, suggesting that economic risk and control of subsistence production were maintained at the individual-household level. Cooking was also a small-scale, intra-household activity. Small hearths, surrounded by low semicircular kerbs of plaster or stone, are located in designated areas and associated with benches, bins, hobs, cooking pots, and serving vessels. This suggests that both production and consumption networks were restricted to immediate household members.

The household also served as the primary unit for domestic production and maintenance of textiles, ceramics, and lithics. Clay spindle whorls and loom-weights and metal and bone needles were recovered from most units. Even more common are stone querns and rubbers used for grinding cereals. Broad-based arguments for household pottery production are supported by the widespread recovery of clay and stone burnishing tools, sherds with mend holes, and over-fired and "non-professionally" made vessels. On-site knapping of chert and the manufacture of ground-stone tools are also indicated in a number of rooms.

Our observations so far suggest a relatively egalitarian society, at least in terms of differential wealth and the control and distribution of resources. Whether this was matched by symmetry in gender or other relationships within the household is, however, another question. In a study of gender in ancient Cyprus, Bolger (2003: 21–50) traces changes in the spatial configuration of domestic structures from the Neolithic through the Bronze Age, noting a shift in emphasis from exterior to interior, open to closed, and public to private. Among the formal mechanisms used to regulate social interaction are the isolation of households, the compartmentalization of interior space, the location of storage facilities within buildings, and an increasing focus of domestic activities in interior locations. These are all visible at Marki. They were not, however, in place when the village was founded but emerged over time, leaving open the possibility that changes in the nature and structure of households and gender relationships were driven as much by local factors as by wider sociocultural imperatives.

The privatization of domestic space at Marki coincided with increases in the size of the community and of individual families and with improved economic security at the household level. The social and economic cooperation visible in Phase B may have been a survival mechanism in a community perhaps numbering only a few dozen people, dispersed among a handful of households in relatively inhospitable terrain. Within a hundred years or so, this was replaced by self-contained semi-enclosed house compounds, suggesting that residential units were now secure enough to meet the majority of their needs and survive as independent economic entities. This is likely to reflect the creation of reliable production and risk management systems and to have been accompanied by a desire to establish and maintain private ownership of buildings, land, livestock, and other resources. As the population of the village continued to expand, perhaps to 300 or 400, the nature of interpersonal relationships must have changed further as distances increased and access between compounds became more difficult. This is likely to have given rise to mechanisms of social cohesion and control operating beyond the level of the household and to be reflected in the development of privacy devices, formal access routes, and fully enclosed households.

Other observations relate these developments to the artifactual data. In Phases A and B, the structural evidence suggests cooperative storage, preparation, and consumption of food between several, probably kin-related, households. From Early Cypriot I (about 2300–2200 B.C.E.) onward, however, staples were stored in closed courtyards and interior rooms, and ovens were reduced in size and moved into kitchen extensions. At the same time, decorated table ware, which had been prominent during the earliest, Philia, phase of occupation virtually disappears (Frankel and Webb 2006a: 147–48, 315–17). This suggests that social interaction between households was more restricted in Early Cypriot I and II (about 2300–2100 B.C.E.), in keeping with the increased architectural isolation of house compounds and the location of hearths and ovens in interior rooms.

A significant innovation in Early Cypriot III (about 2100–1950 B.C.E.), when courtyards were fully enclosed and the process of privatization of the household appears to have reached its maximum extent, is the introduction of anthropomorphic figurines, primarily if not exclusively depicting females and infants, and small models of cattle. This may reflect, in the first instance, an increasing desire to control the source of future labor (i.e., the reproductive potential of adult female members of the household) in an intensive agricultural economy. Cattle, also, are a valuable form of capital and likely to have served as a form of "indirect storage" against the periodic failure of crops as well as a means of establishing social ties through exchange. They also provided more than half of the meat supply at Marki and were clearly of paramount economic importance (Croft 2006).

The introduction to Cyprus of intensive agricultural technologies at the beginning of the Bronze Age significantly increased the capacity for both household and settlement growth. Agricultural intensification and accelerated birthrates gave rise, at the same time, to an increased focus on economic production at the household level and an expansion in the range and probably the duration of domestic activities, particularly cereal processing and storage. These key elements of Bronze Age society were present from the foundation of the village at Marki. Subsequent localized changes in the nature of the household may be seen as a result of demographic growth and emerging concepts of private property rather than, or alongside, wider changes in socioeconomic structures and concepts of the social household.

The enclosure of the household, in Cyprus as elsewhere, is likely to have led to a relegation of women and women's activities to the interior and to increasingly sharply defined gender identities within and beyond the domestic sphere. Citing both ethnographic and archaeological studies, Bolger (2003: 37–38) suggests a correlation between the increasing segmentation of domestic space and a gender-based division of labor. This is supported by the representational data (Bolger 2003: 39–41; Webb 2002: 93–94). Early and Middle Bronze Age Cypriots produced an array of modeled clay figures, either free-standing or attached to pottery vessels. These suggest that certain tasks were consistently performed by women who are repeatedly represented as active agents in one or another of three major capacities: as lovers or partners; as mothers (or child-minders); and as a source of productive labor. This last category includes specific depictions of grinding (e.g., Karageorghis 1991: pls. 70, 75), pounding (e.g., Karageorghis 1991: pls. 74.3, 77.1), baking (e.g., Karageorghis 1991: pls. 74.2, 85.5), and perhaps pot-making. Where sexual characteristics are indicated, they are female. Even where they are not, it is likely that figures were identified as male or female by virtue of the tasks they are engaged in—that is, it is likely that particular activities were so categorically gendered that the depiction of primary sexual characteristics was not necessary. These models may indeed not only reflect gender categories, as these were understood by the people who made and viewed them, but have informally served to reinforce gender identity as a social fact.

The repeated portrayal of women in secondary food-processing activities and the lack of overlap between male and female tasks implies a sexual division of labor in which men and women had consistent gender identities that were related to their production roles. Residual systemic inventories and nonportable facilities from Marki suggest that the activities depicted (grinding, pounding, baking) were primarily carried out in hearth rooms, allowing us to link female tasks with interior household space. Whether this signifies gender segregation or even seclusion remains uncertain but seems unlikely. Hearth rooms at Marki and elsewhere also produced residues from flint-knapping, wood-working, and ground-stone artifact production, suggesting that they were used as work spaces for a wide range of domestic maintenance activities probably involving both male and female members of the household.

Evolving Structures and Relationships

Having established a broad history of the site and situated idealized households within it, we turn our attention to a finer-scale analysis of one part of the excavated area at Marki. Although only observable at the scale of two or even three generations, the model of architectural development that we have constructed allows us to explore the dynamics of some relationships within this neighborhood (fig. 11; Frankel and Webb 2006a, 2006b). One aspect of this is the varied patterns of continuity, longevity, and change in the size of individual households, revealing the control of some areas by particular families, the changing structure and needs of others, and

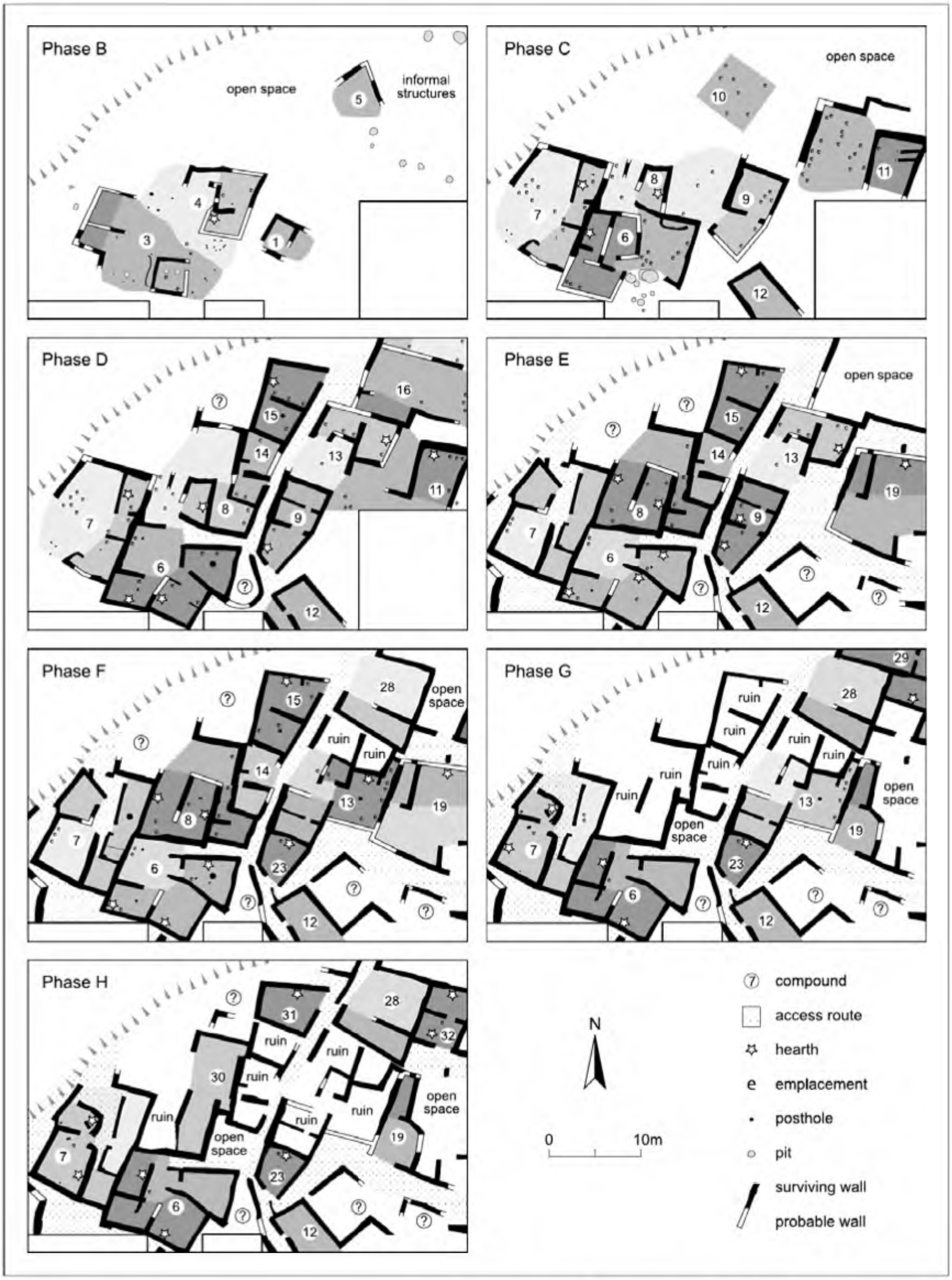

Fig. 11. Changing compound structures and relationships in one part of the excavated area from Phase B to Phase H.

the negotiation of property rights between them. These decisions may have been made at the individual, family, or community level.

We take up the story during Phase B, a generation or two after the site was first settled. The preceding Phase A architecture is similar but not well preserved; indeed, we are fortunate to have any buildings that we can clearly identify as belonging to these earliest times. Although no complete Phase B compounds survive, it is clear that the buildings revealed in our excavations were on the edge of what was probably still a very small village. To the northeast of the stone and mud-brick houses was open space, where pits, post-holes, and other features indicate the presence of light, temporary, or informal structures such as small pens and sheds and associated activity and discard areas. The compounds do not have the same clear boundaries or enclosing walls that appear later; perhaps only light fences defined household territory or space, with open access between houses. Compounds 3 and 4 may be viewed as two houses with separate private, covered space but shared courtyard resources, forming a closely allied residential and economic production unit. The presence of communal facilities located in the courtyard, such as a large bread oven, also suggests cooperation. Such a cooperative system is appropriate for a small population, where individual households—indeed the community as a whole—lacked the resources to be fully independent.

As the population of the village increased, the built-up area expanded beyond its original limits to occupy a greater part of the excavated exposure. Though there was little specific reuse of walls, continuity in the location and alignment of the new structures suggests the inheritance of some spaces. Two large and well-defined compounds (Compounds 6 and 7) in the southwestern part of the excavated area are of particular interest. In Phase C, these took over the space of the earlier Compounds 3 and 4. Both continued with only minor changes and internal renovations for several centuries, until the end of Phase H (figs. 6, 7, 10). These primary establishments may be regarded as belonging to founding families, which kept control of these domains for many generations. The remainder of the space previously used by Compound 4 was subdivided with the western part becoming Compound 8 and the eastern area taken over as courtyard space by Compound 9. The light dividers between compounds that were a feature of Phases A and B were replaced by more substantial walls. This restricted access and provided greater privacy, including more hidden, rather than publicly visible, storage. Some compounds, however, were not entirely cut off from one another. The courtyards of Compounds 6 and 8, for example, were interconnected. This suggests a particular relationship between these two households, perhaps that of an extended family. In any case, it is possible to argue that the two equally-sized households with communal courtyard space that existed here in Phase B (Compounds 3 and 4) were replaced in Phase C by two equal-sized, non-communicating households (6 and 7) and a smaller household, Compound 8, which appears to be an offshoot of the parent Compound 6. Although a larger area was now built over, compounds were not all adjoining, allowing relatively free and open access between them and across the village area.

The inhabited area expanded farther in Phase D, making it necessary to create a formal north–south laneway to provide access through this part of the settlement. This must have involved considerable renegotiation of spatial boundaries and, presumably, of property rights. Decisions of this sort may have been at a community, rather than at an individual, level. Some preexisting compounds were substantially restructured. Compound 9, for example, lost its courtyard and was reoriented to become a three-roomed house entered directly from the laneway to the south, and a number of new compounds were built on either side of the lane. Compound 8 was enlarged to the north and east, taking in some of the area previously held by Compound 9. Compounds 6 and 7, however, retained their overall size and position, although there was some modification to the former (see also fig. 7). The close relationship between Compounds 6 and 8 continued, with both now entered through a short passage leading in from the main laneway. Although there was still close cooperation between these two families, the expansion of Compound 8 to much the same size as Compound 6 suggests that the earlier dependent relationship had altered to one of greater equality.

The western half of the courtyard of the earlier Compound 11 now became the inner hearth room of the new Compound 13. This transference of property and the open access that existed between the courtyards of Compounds 11 and 13 in Phase D suggest a similar inter-household relationship to that of Compounds 6 and 8. They likely in both cases reflect the periodic sharing of built space over time between closely related families or/and within expanding, fissioning, or contracting family units.

The general trend toward greater separation and privacy continued with the increased density of building in Phase E. Compound 7 was now completely walled off and reoriented to the north. In Compound 8, the two inner rooms were enlarged, and a third room was added to the west. The opening between Compounds 6 and 8 was closed, and these compounds were fully separated from one another: indeed movement from one to the other would now have required a long detour, making use of the more extensive system of laneways. These families were now physically if not socially separated and presumably wholly independent. Internal developments within Compounds 6, 7, and 8 may therefore reflect changing needs within family units as well as the repair and replacement of older walls and features.

Similar developments characterize the succeeding Phase F. These involved internal renovation, the construction of new compounds, and the reallocation of space between compounds. Major changes included the construction of Compound 28 on a substantial platform, which partly took over open space to the north as well as the two interior rooms of Compound 13 to the south. This involved the partial demolition of older walls, which remained in place as abandoned ruins. Compound 13 itself expanded to the south and east, taking over two rooms of the old Compound 9 and part of the access way between Compounds 13 and 19 on the east. The incorporation of the latter suggests that Compound 13 may have retained or reasserted "rights" to the use of this space, which it shared with Compound 11 in Phase D. This restructuring of Compound 13 led to an overall increase in size and a substantial increase in the ratio of inner to courtyard space. The loss of the two original inner rooms to the new Compound 28 was amply compensated for by the appropriation of the two rooms belonging previously to Compound 9 as well as the open space to the east. Thus, Compound 13, which had been a two-roomed household in Phases D and E, became a three or even four-roomed unit in Phase F. The losers in this process, if there were any, appear to have been the owners of Compound 9, which was now subdivided to produce a new form—the single room household (Compound 23).

This reorganization had a substantial effect and must have involved considerable negotiation of rights of ownership and access. It also had broader implications, as the appropriation of what had earlier been open space between Compounds 13 and 19 cut off this communication route between the southeastern and northeastern sectors of the village.

During Phase G, the center of village activity probably began to shift southward, away from the excavated area, starting a slow decline as some compounds fell out of use and were not replaced. The oldest compounds (6 and 7) continued to be occupied within their original boundaries. Compounds 8, 14, and 15 on the west of the north–south lane were abandoned and left as standing ruins, gradually crumbling into open space. Compound 19 also contracted significantly at this time, creating a new open area to the east.

The overall density of occupation continued to decline in Phase H. The long-lasting Compounds 6 and 7 remained in place, while there was some reuse of the space to the west of the north–south laneway with the construction of Compounds 30 and 31. To the east of the laneway, Compound 13 was abandoned, and others retracted in size.

Phase I saw the last activity in this area with only one or two rooms showing evidence of minimal occupation. This represents the final phase in an on-going process of localized abandonment associated with a gradual shift in the main focus of occupation toward the south. Surface and subsurface surveys, together with trial excavations 200 meters to the south of the main exposure, suggest that occupation continued at Marki for another generation or two before final abandonment. No simple explanation can be given for the cessation of occupation. It may have been the result of centuries of over-grazing and soil depletion driven by the increasing demands of an expanding population, perhaps exacerbated by a short-term drought. It appears also, however, to have been part of a broader restructuring of settlement across the island in the Middle Bronze Age with evidence elsewhere of a rapid rise in population that can only be explained by the movement of people from smaller villages into strategically located regional centers (Frankel and Webb 2007: 159–61).

This narrative provides a general developmental sequence within which we can see fine-scale changes in social relationships over several centuries in an evolving social and economic system.

Concepts, Cycles, and Decisions

In this section, we turn our attention to the broader implications of the primary narrative outlined above. Rectangular house compounds comprising two or more inner, covered rooms set at the rear of a larger courtyard were built at Marki from first settlement until final abandonment. Although some different compound types, such as single-room units and larger compounds with no courtyard space, did develop or evolve, the majority of newly established compounds through Phase H, especially those erected in open areas not constrained by existing structures, took this traditional form. This suggests an idealized concept of a physical household that remained in place throughout the life of the village. The introduction of new household types and the reconfiguration of spatial arrangements within existing compounds can be seen as specific responses to particular needs at an individual household level rather than a result of broader-scale changes in the concept of what constituted a household.

The maintenance of a fairly standard alignment of walls reflects the embedded influence of the existing structures, which exerted an unconscious influence on builders. Within this general pattern, the specific rebuilding of replacement walls above remaining stumps may represent both a symbolic incorporation of memories of the past and an assertion of ownership or control of space and perhaps also the inherited rights to particular plots and structures. General developments in the excavated exposure appear to be the result of gradual demographic growth and the constant need to maintain mud-brick structures.

Natural processes of physical decay within existing compounds led to a regular cycle of renovation and internal restructuring and sometimes more major rebuilding. Overriding the specific episodes of renovation and rebuilding, however, there are long-term continuities of spatial order, alignment, and structure. Where buildings and features remained in use over many generations, it seems reasonable to argue for continuity of ownership as well as of social attitudes and relationships. These long-lasting associations can be understood as implying inherited rights to both space and built property.

Although the specific processes will never be visible archaeologically, the periodic reorganization of space can provide a basis for thinking about the ways in which decisions were made and rights and ownership assessed and negotiated within this community. As noted above, longevity of use is most evident in the case of Compounds 6 and 7, which maintained their physical boundaries for three or four centuries while other, newer compounds went in and out of use (fig. 7). If we are correct in arguing for intergenerational ownership of property, then these households can be thought of as remaining in the hands of well-established families, perhaps even the descendants of the pioneer occupants of Compounds 3 and 4 in Phase B. Taking this further, we may suggest that these families enjoyed considerable social prestige. This may have allowed them to resist subdivision and retraction and is perhaps also manifested in features such as the private access passage to Compound 6 and the ability of this family to establish and maintain an offshoot compound (Compound 8). Indeed, legitimization of status and authority in the village may have been closely linked with ancestral legacy and reinforced through the longevity of house compounds.

Although the scale of observation—at intervals of perhaps three generations—makes it difficult to see the evolution of a domestic cycle at an individual or anthropological time-scale, some such processes can be identified. For example, the initial disparate size of the interconnected Compounds 6 and 8 in Phase C, followed by the growth of Compound 8 in Phase D and its later physical separation from Compound 6 in Phase E, may be seen as involving the establishment of a subsidiary family, its expansion over several generations, and ultimately its separation as it became a fully independent entity. A similar though less lengthy process is visible in the case of Compounds 11 and 13 in Phase D, where restructuring took the form of a drastic subdivision and retraction or enlargement of space. This must have involved complex individual negotiations between neighbors or family members working toward private agreements. In some cases, as with the establishment of the north–south laneway in Phase D, this may have involved more communal decision-making.

Some observations may be proposed with greater confidence. There is, for example, an increase over time in inter- and intra-household privacy. This is expressed in the full enclosure and deceasing size and importance of courtyards, the establishment of controlled access routes, and, in some cases, private entry passages and the development of the single-entry non-courtyard house with multiple rooms leading progressively one from the other. It may also be manifest in the increasing visual and spatial separation of compounds by access routes, open space, and standing ruins.

Of particular interest are the changes in social structure and relationships implied by structural developments from the earliest Phases A and B to Phases C and D. In Phase B, the inner rooms of Compounds 3 and 4 faced onto a minimally enclosed communal courtyard where a wide range of maintenance and production activities were carried out. This high level of social and economic cooperation between households may be viewed as a survival mechanism appropriate to a newly established pioneer community, perhaps numbering only two or three dozen people dispersed among a handful of households. In Phase C, this cooperative system was replaced by two new, noncommunicating compounds (Compounds 6 and 7) of roughly equal size with almost fully enclosed courtyards and opposing orientations.

The establishment of self-contained house compounds within a century or so of first settlement shows that individual residential units were now secure enough to meet their own physical needs and survive as independent economic entities. This is likely to reflect an overall increase in population and perhaps in family size, as well as the development of efficient and reliable production systems and inter-site relationships. It is also likely to be related to an increasing desire by individual households to establish and maintain private ownership of buildings, land, and other resources. The establishment of Compound 8 as an offshoot of Compound 6 at this time further suggests that the breakdown of inter-household cooperative systems coincided with an increased emphasis on extended family relationships and the establishment of a new generation of independent households.

The nature of interpersonal relationships within the village as a whole must have changed considerably through time as the population expanded and access between compounds became more restricted or more difficult. In the early phases, with only four or five households and a population of a few dozen, individuals would have had face-to-face interaction with fellow-villagers on a regular basis. Later generations of people living in a larger, more densely inhabited settlement, are likely to have had significantly fewer occasions for interaction beyond their immediate neighborhood. This increase in interpersonal distance coincided with the development of more enclosed household and access systems and may have been accompanied by the establishment of new mechanisms of social cohesion and control. These presumably operated beyond the level of the individual household and are not visible in the excavated exposure.

Structural Continuities and Transformations

The intimate history we have constructed for Marki provides an opportunity to move beyond the formal archaeological production of sequences and descriptions to an exploration of social processes and dynamics. We are of course aware of the many decisions and assumptions made at every level of this process and of the way in which the understanding we now have of this site feeds back into our general models of Cypriot Bronze Age society and its development during the lifetime of our small village. We must also recognize that these broader models are not independent of our understanding of events at Marki but have been substantially influenced by the results of these excavations.

Developments in Bronze Age Cyprus as a whole provide a background but are also crucial factors leading to the initial establishment, later patterns of interaction, and final demise of Marki. Of particular importance is the growth in population, both generally and within the village. This slowly transformed the nature of relationships within the community and interconnections with other places. From its small beginnings, when the settlement was dependent for survival on other communities and had too few people to sustain local craft production, the village grew increasingly independent, with associated changes in the nature of its external relationships. These changes were mirrored within the community, with a move from cooperative relationships toward greater privacy and separation over time. Other aspects of households show strong conservatism in the structure and organization of space and facilities.

The development of the built environment at Marki gives us an opportunity to see ways in which the past influenced decisions and structured or limited opportunities for change. It seems clear that decisions made when the first buildings were erected about 2350 B.C.E. had a continuing influence on later patterns. In this way, the general uniformity of building alignment may reflect the unconscious influence of the past. However, specific instances of the building of new walls directly above earlier demolished structures are more likely to be related to availability of space and a continuity of property rights, if not inherited ownership, of land. The long continuity of some compounds over many generations provides additional support for seeing households or families as dynamic rather than static entities.

There is no evidence of formal planning; rather, changes appear as short-term, contingent decisions made to address needs at particular times. These included the expansion and contraction of house compounds, reflecting cycles of household growth and decline. Processes of decision-making are revealed by variations in the size and organization of compounds. Some would have been individual or family decisions during minor renovations or rearrangements within a compound; others must have involved negotiations with neighbors, or the assertion of control over abandoned areas or buildings; others again—as in the establishment of formal access lanes—may have been organized through more communal decision-making. There is no evidence, however, for more formal authority or hierarchy beyond that of a relatively egalitarian, kin-based system.

At Marki, we can trace a complex interplay between systemic and contingent change. Embedded traditions and the influence of older buildings provided a strong degree of continuity in the ideal house form. At the same time, the demands of household and family developmental cycles, together with broader changes in community size and structure, required numerous *ad hoc* and immediate responses to particular circumstances. Thus, while there was an ideal Bronze Age household, there was no standard building. The village and the families within it were in constant flux, balancing practical, social, and conceptual factors from one generation to another. These aspects of households as architectural entities and behavioral units are likely to be typical of small-scale agro-pastoral settlements well beyond Cyprus. The principles that underpin their observation, recording, and presentation at Marki may thus be seen as having broad application.

Acknowledgments

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How Households Can Illuminate the Historical Record:

The Judahite Houses at Gath of the Philistines

Jeffrey R. Chadwick and Aren M. Maeir

Household archaeology has helped answer intriguing questions at Tell es-Safi/Gath in Israel. The site is confidently identified as the ancient city known in the Hebrew Bible and Assyrian annals as Gath, the capital of the Philistine Pentapolis, based on both the relevant texts (Rainey 1975; Schniedewind 1998) and the archaeological remains (Maeir 2007, 2008). The questions, which arise from certain allusions in the ancient written sources—namely, the Hebrew Bible and certain Assyrian annals—are (1) whether or not any settlement existed at the site during the 8th century B.C.E. (Iron IIB) and (2) whether or any such settlement represented one or more Judahite phases at biblical "Gath of the Philistines." And the answer to both questions, suggested by the excavated remains of houses at the site, is "yes."[1]

In order to illustrate how these questions have been answered and why they even arose, it is first necessary to explore the background of the excavation site and specifically to describe the discovery of the Iron IIB houses in Area F and why they can be dated to the 8th century B.C.E. and identified as Judahite households. Because this chapter will be the first account of finds from the excavations of Area F at Tell es-Safi/Gath to appear in print, a significant amount of detail will be provided.[2]

About the Excavation Site

Tell es-Safi/Gath is located in south-central Israel, approximately halfway between Jerusalem and Ashkelon, on the border between the Southern Coastal Plain (ancient Philistia) and the Judahite foothills known in Hebrew as the *Shephelah* (fig. 1). The tell is located atop a high, massive hill that overlooks the coastal plain to the west, where three other ancient Philistine cities—Ashdod, Ashkelon, and Gaza—were located along the Mediterranean coast. Ekron, a neighboring inland Philistine city, was located 10 km north of Tell es-Safi/Gath, at Tel Miqne. Ancient Gath itself boasted a settled area of some 20 ha (50 acres) during most of its existence but grew to as large as 50 ha (125 acres) at its zenith during Iron IIA. Since 1996, the site has

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[1] For an additional household archaeology perspective on finds from Tell es-Safi/Gath, in this case a study of a large LB II building from the site, see Shai et al., 2011.

[2] Work has begun on a preliminary report of finds from Area F from the first five seasons.

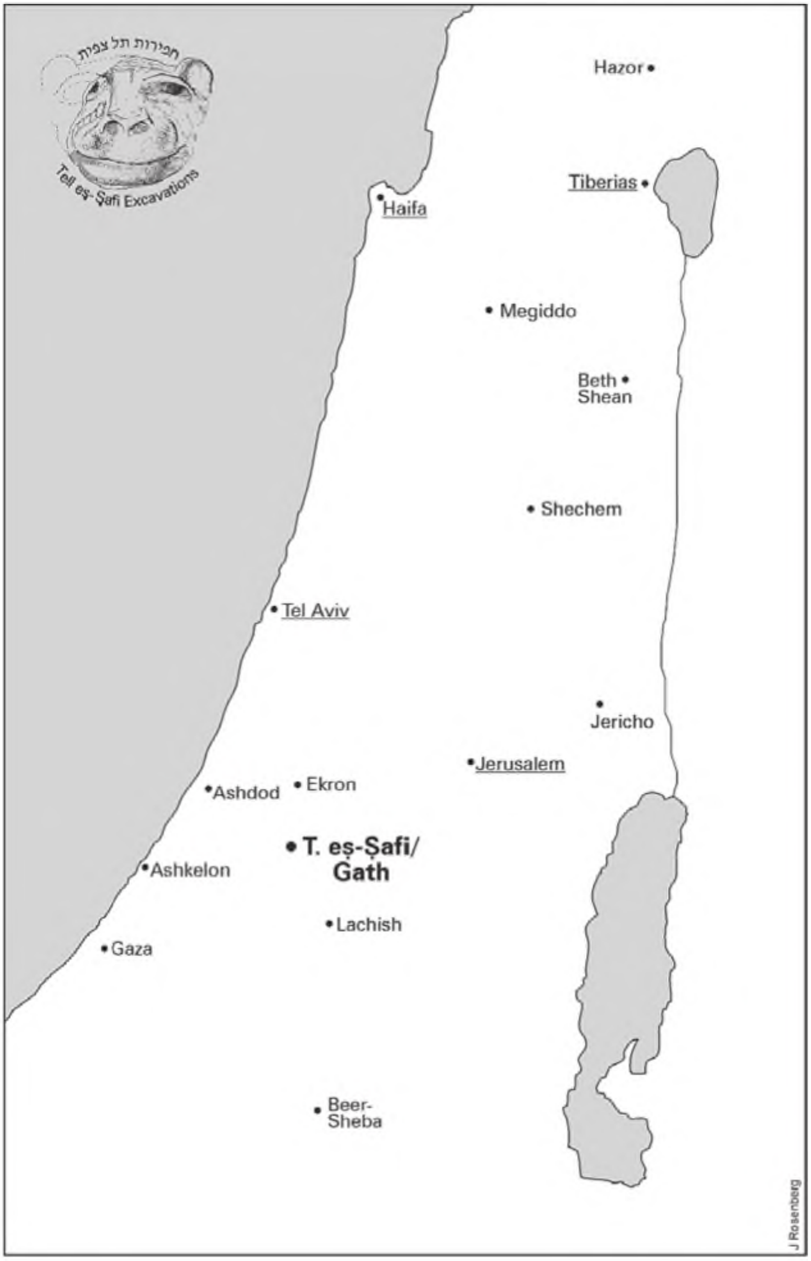

Fig. 1. Tell es-Safi/Gath is located in south-central Israel, at the eastern edge of the coastal plain (ancient Philistia) and the western edge of the *Shepelah* (low hills) of ancient Judah.

been researched, explored, and excavated by the Tell es-Safi/Gath Archaeological Project, a long-term, interdisciplinary, multinational research endeavor directed by Professor Aren M. Maeir of Bar-Ilan University in Israel (Maeir 2003, 2004, 2008, 2012). Large excavation areas on the lower east side of the tell (Areas A, C, E, and P; see fig. 2) have revealed strata dating from Iron IIB, Iron IIA, Iron I, LB II, and EBA periods.

The excavation area that is the subject of this study is Area F, located at the upper west-side summit of the tell. Excavations in Area F are supervised by Professor Jeffrey R. Chadwick of Brigham Young University. Area F features all of the archaeological

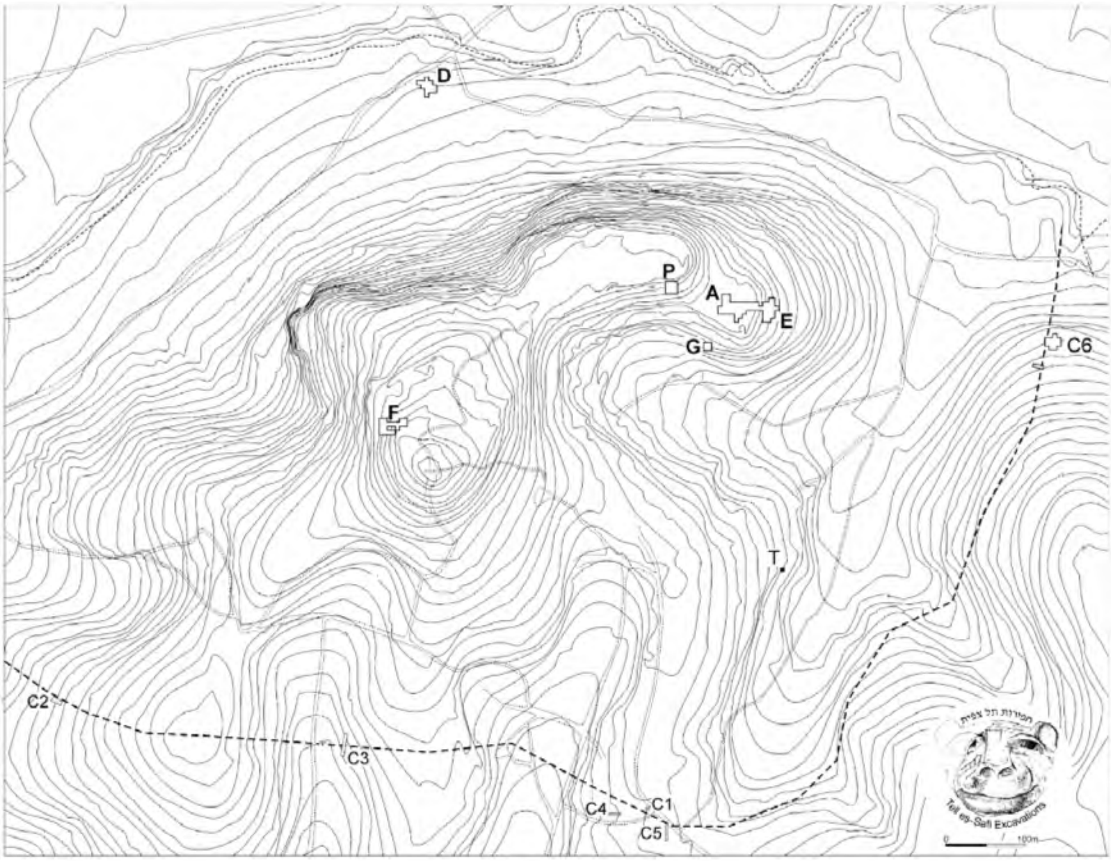

Fig. 2. Topographical map (north at top) of Tell es-Safi/Gath, showing areas excavated by the Tell es-Safi/Gath Archaeological Project between 1996 and 2008.

periods discovered in the other areas, as well as MB IIB, Persian Period, Roman–Byzantine, and Crusader Period strata, including foundations of the 12th-century A.D. Crusader fortress *Blanche Garde*.[3] Later Mamluk and Ottoman Period graves are also located in Area F. At the present, some thirteen strata of occupation and use have been discerned in Area F, and it is expected that future seasons of excavation will define even more stratigraphic phases.

Settlement Patterns at Gath

The Tell es-Safi/Gath Archaeological Project has revealed the oscillating pattern of the settlement of the site through the various periods—a pattern that can be seen over a long range of periods (Maeir and Uziel 2007; Uziel and Maeir 2006). The first evidence of a large settlement is during the Early Bronze Age, with evidence of a large city that covered close to 50 ha during EB I and EB III. A much smaller MB II city, fortified by city wall and glacis, occupied the summit of the tell (discerned only in Area F). During the Late Bronze, the site grew back to a large area similar in size to the Early Bronze city. At the onset of Iron I, the entire settled area experienced the

[3] For a preliminary study of the Medieval Periods at Tell es-Safi/Gath, see Boas and Maeir 2009.

F-1	Ottoman	16th – 20th C.E.	graves, village remains
F-2	Mamluke	13th – 15th C.E.	graves, village remains
F-3	Crusader	12th C.E.	fortress, graves
F-4	Early Medieval	7th – 11th C.E.	terrace wall portions
F-5	Rom–Byz (prob)	1st – 6th C.E.	structure wall
F-6	Persian period	5th – 4th B.C.E.	house room
F-7	Iron II-B	end 8th B.C.E.	terrace house B, lower house
F-8	Iron II-B	mid-late 8th B.C.E.	terrace house A, kitchen/bakery
F-8A	earthquake	early-8th B.C.E.	widespread brick collapse
F-9	Iron II-A	9th B.C.E.	thick structure walls, bone tool shop
	More to be excavated in Area F – Upper Below are strata identified in Area F – Lower		
FL-1	Iron Age I	11th B.C.E.	structure walls, bichrome phases
FL-2	Iron Age I	12th B.C.E.	structure walls, Myc. III-C phases
FL-3	Late Bronze II	13th B.C.E.	structure walls
FL-4	Middle Bronze II	17th B.C.E.	city walland sand glacis, ceramic
FL-5	Early Bronze III	tbd	city wall portion, ceramics

Fig. 3. Temporary stratigraphy for Area F at Tell es-Safi/Gath as of 2008 excavation season. The relevant strata discussed in this chapter are temporary Stratum F7 and temporary Stratum F8.

radical material culture shift that most scholars believe indicates the arrival of the Philistines (e.g., Dothan 1995, 1998, 2000). Samples of the very earliest Philistine decorated pottery, a style known as Mycenaean IIIC,[4] have been found in Area F, suggesting that the site became Philistine Gath during the earliest Philistine settlement phases of the 12th century B.C.E. Typical Iron I Philistine bichrome pottery (also known as Philistine II; Maeir 2005) has been discovered in both Area F and in the areas on the eastern side of the tell (Areas A and E) in domestic dwelling contexts.

Philistine Gath's greatest extent, in terms of both territory and influence, was reached in the 10th and 9th centuries B.C.E., during Iron IIA, when the city extended not only to the lower east side of the tell but also all the way down to the Elah Valley stream-bed on the lower north side of the tell (the location of Area D). Iron IIA Gath was the largest of the Philistine Pentapolis at the time. These dimensions are probably reflected in the central role given to this city in the biblical narratives of the early Israelite monarchy (such as the depiction of young David's connection to this site; see 1 Sam 27:2–5). Gath was attacked and destroyed in the second half of the 9th century B.C.E., almost certainly by Hazael of Syria (as noted in 2 Kgs 12:17; see Maeir 2004, 2009). The Syrian assault on Gath included the construction of a siege trench that circumvallated the entire tell on the east, south, and west sides; the Elah Valley riverbed served as the northern component of the circumvallation (Ackermann

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[4] Also termed Philistine I; see Dothan and Zukerman 2004, Maeir 2005.

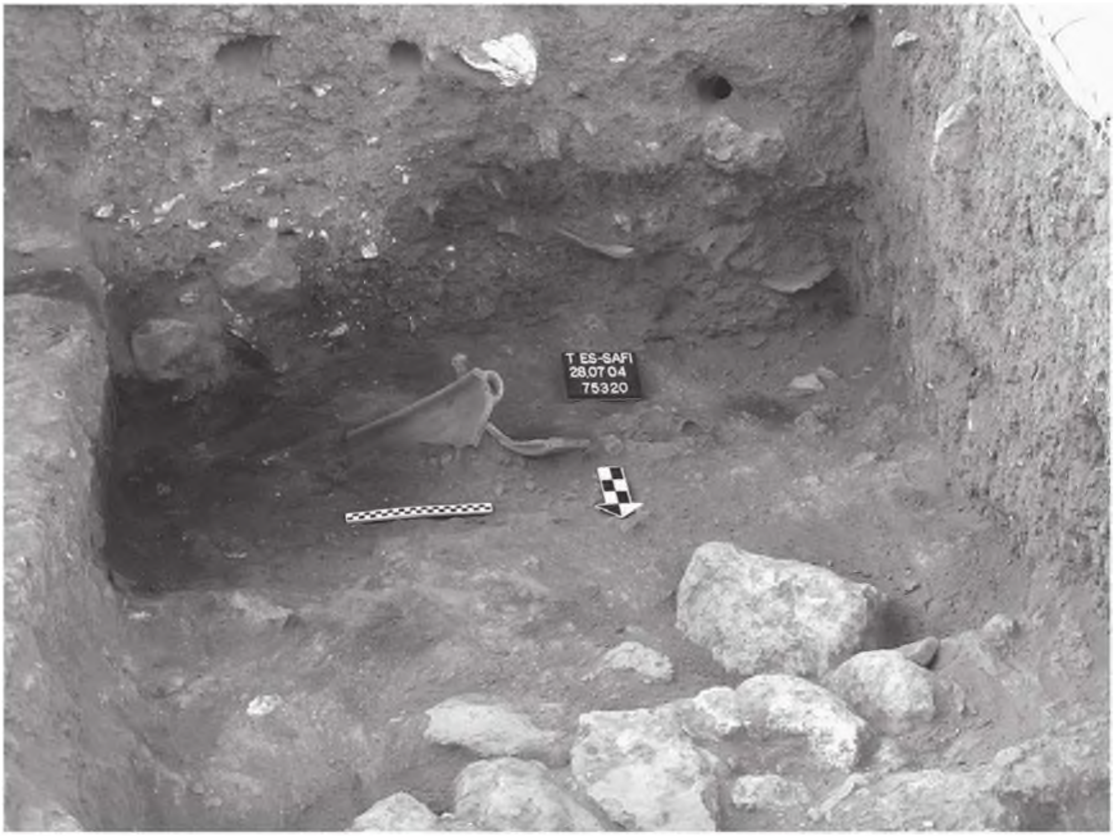

Fig. 4. Destruction debris (locus 75320), including burned brick remains and Iron IIB Judean pottery types, in "Lower House" 75350 from the terminal event of Stratum F7, which the authors identify as the Assyrian attack on Judean Gath by Sennacherib in 701 B.C.E.

et al. 2005; Maeir 2004, 2009; Maeir and Gur-Arieh 2011). It was Hazael's attack that brought an end to "Gath of the Philistines," not only as a Philistine royal capital, but as a Philistine city in general.

Between 1997 and 2002, the Tell es-Safi/Gath Archaeological Project excavations in Area A, on the lower east side of the tell, discovered a massive destruction phase from the end of Iron IIA, which became known as Stratum A3. The material assemblage from this destruction level was quite similar to other Iron IIA assemblages from Philistia, such as that found at Ashdod. It included typical decorated pottery and other types (Ben-Shlomo et al. 2004, 2008; Maeir and Shai 2005, 2007; Shai and Maeir 2003, 2008). Atop the ruins of Stratum A3, a single phase of Iron IIB occupation was revealed, and this became known as Stratum A2. Stratum A2 was dated to the 8th century B.C.E. based on Iron IIB ceramic finds (Avissar and Maeir 2012) and was tentatively identified as a possible phase of Judahite habitation. But the exact nature of the population of this phase is not clear.

The 8th Century B.C.E. Judahite Houses in Area F

In 2004, Area F was opened for excavation at the summit of Tell es-Safi/Gath. The goal was to discover the extent to which the most prominent part of the tell

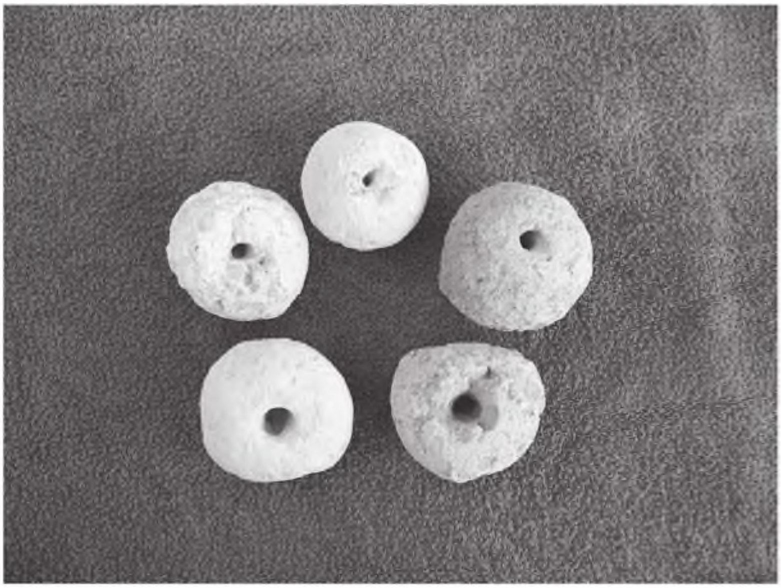

Fig. 5. Loom weights recovered from the court area of "Lower House" 75350, Stratum F7, indicating cloth production activity at the residence.

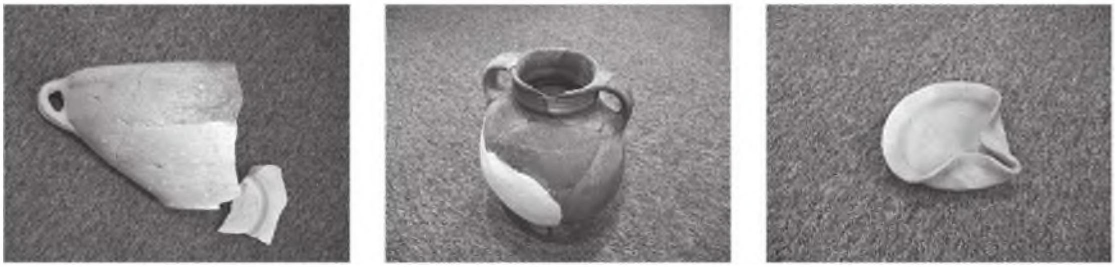

Fig. 6. Iron Age IIB Judean style pottery types recovered from the destruction debris of "Lower House" 75350, Stratum F7.

had been occupied in antiquity and during which periods, as well as to provide a relative stratigraphy to which strata and finds in other areas could be compared. Five seasons of excavation in Area F have revealed thirteen different strata dating from the Early Bronze Age to the Ottoman Period (fig. 3). During the 2004 season, working around and through medieval graves, excavators unearthed a single room from a domestic house featuring pottery remains (krater fragments) typical of the late 8th century B.C.E., comparable to pottery finds from Level III at nearby Lachish (Zimhoni 2004), in a burned destruction context (fig. 4). In 2005, an adjacent room of the same house was excavated, as well as part of a cobbled open court, bounded on the south by an exterior wall line which featured pillar bases and a plastered area that may have been the entry portal. The northern part of this open court was cut off by a medieval terrace wall and disturbed by two medieval graves containing a total of five burials. But in the undisturbed southern part of the court a collection of five spherical, perforated loom weights of baked mud were found (fig. 5), suggesting domestic weaving activity in that part of the household. The two rooms, located east of the cobbled court, yielded a collection of domestic pottery that included remains of two storage jars and their large perforated stoppers of baked mud, more pieces of

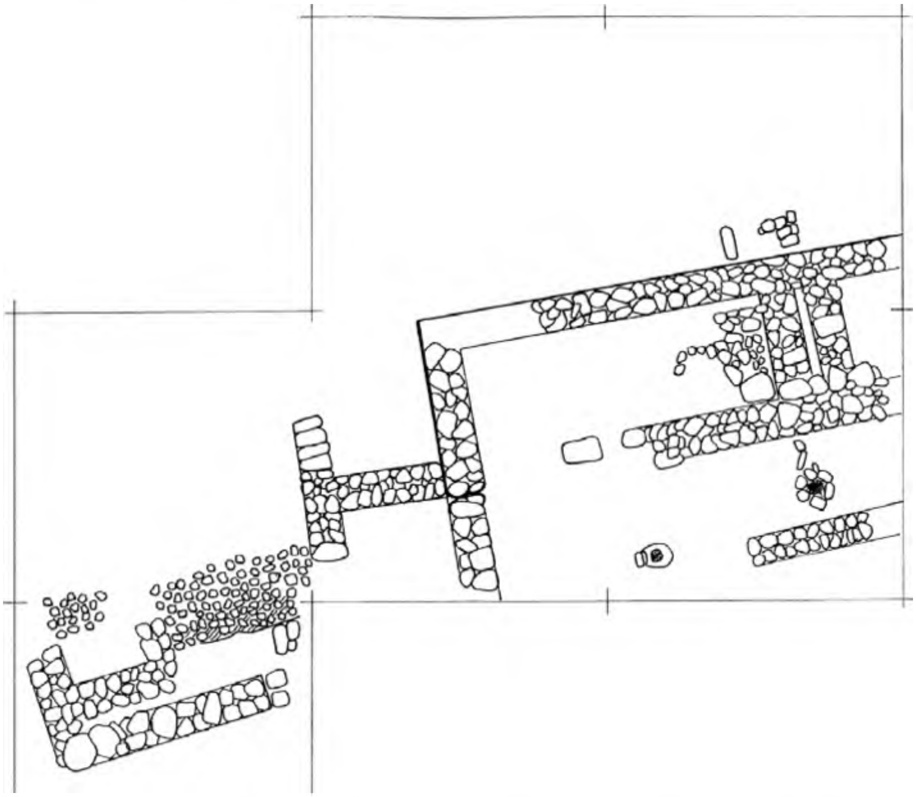

Fig. 7. Temporary Stratum F7 in Area F at Tell es-Safi/Gath (north at top). Architectural remains of two houses: the remains on the right are from the second phase of "terrace house" 105650, and the remains on the left are from the single phase of "lower house" 75350.

the aforementioned krater, a complete oil lamp (with a slightly footed base), the top section of another storage jar (of the "torpedo jar" style), and most of an Iron IIB cooking pot, all of which were typical Judahite types datable to the late 8th century B.C.E. (fig. 6). The two rooms and court of this partially surviving house (referred to in total as Locus 75350) were dubbed the "lower house" by the field supervisor. By the 2008 season, both the construction and the destruction of this "lower house" could be securely dated to the end of the 8th century B.C.E. (Stratum F7).

Some 15 to 20 cm beneath the stamped earth surfaces of the two surviving rooms and cobbled court of the "lower house," an undulating surface featuring no architecture whatsoever (no walls, no installations) was discerned, atop which were Iron IIB ceramic fragments, including a broken portion of a slightly footed Iron IIB oil lamp. These sherds were strewn about what seems to have been an empty lot (Locus 95450) that was dubbed a "rubbish surface" by the excavators—a surface on which refuse was casually tossed. Due to the Iron IIB pottery samples, the "rubbish surface" was identified with Stratum F8 (figs. 7, 8).

The second house in Area F, known as the "terrace house," was discovered during the 2007 season and was situated on a terrace that rose about a meter above the

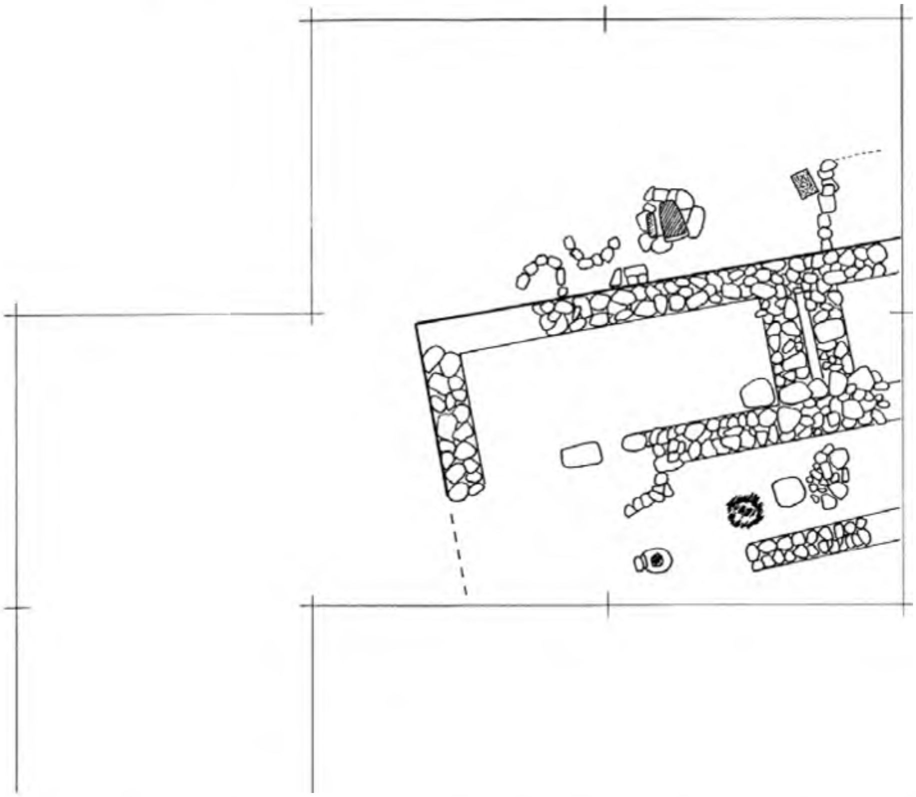

Fig. 8. Temporary Stratum F8 in Area F at Tell es-Safi/Gath (north at top). On the right are architectural remains of "terrace house" 105650 in its first phase, with the remains of kitchen-bakery 85250 located on the lower terrace, just north of the terrace wall. At left is the "rubbish surface" of empty lot 95450.

"lower house." Like its neighbor, the "terrace house" (Locus 105650) was only partially excavated, revealing only its northern rooms and central court. The presence of an outer wall line from the Crusader fortress *Blanche Garde* prevented excavation of a square that might have revealed the southern rooms of the "terrace house," if any indeed survived the Crusader construction activity. And like the "lower house," this "terrace house" was disturbed by medieval burials that eliminated crucial ceramic evidence in the structure's northwest portion. But the courtyard, which featured a large stone mortar, yielded Iron IIB ceramic fragments typical of the late 8th century B.C.E., which allowed the house's phases to be dated.

Remarkably, the "terrace house" was actually occupied in two distinct phases, both of which could be securely dated to the second half of the 8th century B.C.E. The lower, earlier phase yielded fragments of a Judahite-style black-burnished juglet in a collection of Iron IIB domestic pottery sherds found near the mortar. The general level of the stamped earth floor of the court in this phase was 203.70 m above sea level (masl), and in the eastern part of the court a large stone pillar-base (Locus 115603) was embedded in the floor, suggesting that a roof or second storey may have existed in that area. Just east of the pillar-base, a portion of stone cobble pavement was preserved. Immediately west of the pillar base was a defined area of ashy soil, which did not appear to have been the remains of a destructive fire but more likely represented a cooking-fire area or, perhaps, a heating-fire area. This lower phase of late-8th-century B.C.E. occupation and use was assigned to Stratum F8.

In the upper phase of the "terrace house," an entirely different stamped-earth floor was discerned at general level 203.90 masl. This surface was assigned to Stratum F7. It completely covered the earlier Stratum F8 surface, as well as the pillar base, the fire area, and the pottery fragments on the earlier surface. On the Stratum F7 surface, a hearth consisting of a ring of small fieldstones was set into the soil that covered the pillar base from the earlier phase. Two smooth stone weights, probably kitchen weights, were recovered in the soil just north and immediately adjacent to the hearth. One bore a distinctive etched mark. The evidence suggests that this area in the court was a food preparation and cooking area in the later phase. The 20 cm differential between the lower Stratum F8 surface (at 203.70 masl) and the upper Stratum F7 surface (at 203.90 masl), combined with the fact that pillar-base 115603 of the earlier phase was deliberately covered and a hearth (Locus 105614) set into the surface above it, indicates that there was a significant "remodeling" of the house's court area in the later phase. In the northern room compartments of the same house (in an area not disturbed by medieval burials), the same phenomenon was detected: a lower floor from the earlier phase was covered over by a second floor from the later upper phase. In the case of this northern room, the upper phase included a portion of stone pavement (Locus 105619) made of fieldstones set very close together; this pavement could be characterized more as a flagstone surface than a mere cobbled surface.

The surviving walls of both the "terrace house" and the "lower house" are consistent with the Israelite–Judahite house-plan style known as the "four-room house" or "pillared court house" (e.g., Faust and Bunimovitz 2003; Holladay 1997; Shiloh 1987), although the lack of a complete plan for either structure makes this identification only tentative.

The Kitchen-Bakery

Just north of the "terrace house," at a level slightly more than a meter below the "terrace house" surfaces, a kitchen and bakery area was discovered at a general level of 202.70 masl. Elements of the kitchen-bakery (Locus 85250) were built adjacent to, and in some cases abutting, the north terrace wall. But this area was also cut and disturbed on the north by the same medieval wall line that disturbed the "lower house," and so only the southern portion of the kitchen-bakery could be recovered. As a result, it is not possible to determine if this area was a level that belonged to the "terrace house" or whether it was part of a house complex that existed north of and below the "terrace house." The pottery finds also date to the late 8th century B.C.E. in Iron IIB and apparently belong to Stratum F8. The installations and implements of this kitchen-bakery were remarkable and bear brief description here.

A basalt stone-grinding apparatus (Locus 95203) consisting of a large lower grinding stone and two upper hand-held stone grinders was found in a large circular installation made of fieldstones, flanked by several restorable storage pots and bowls (fig. 9). The lower grinding stone measured 40 cm wide at the end where the person

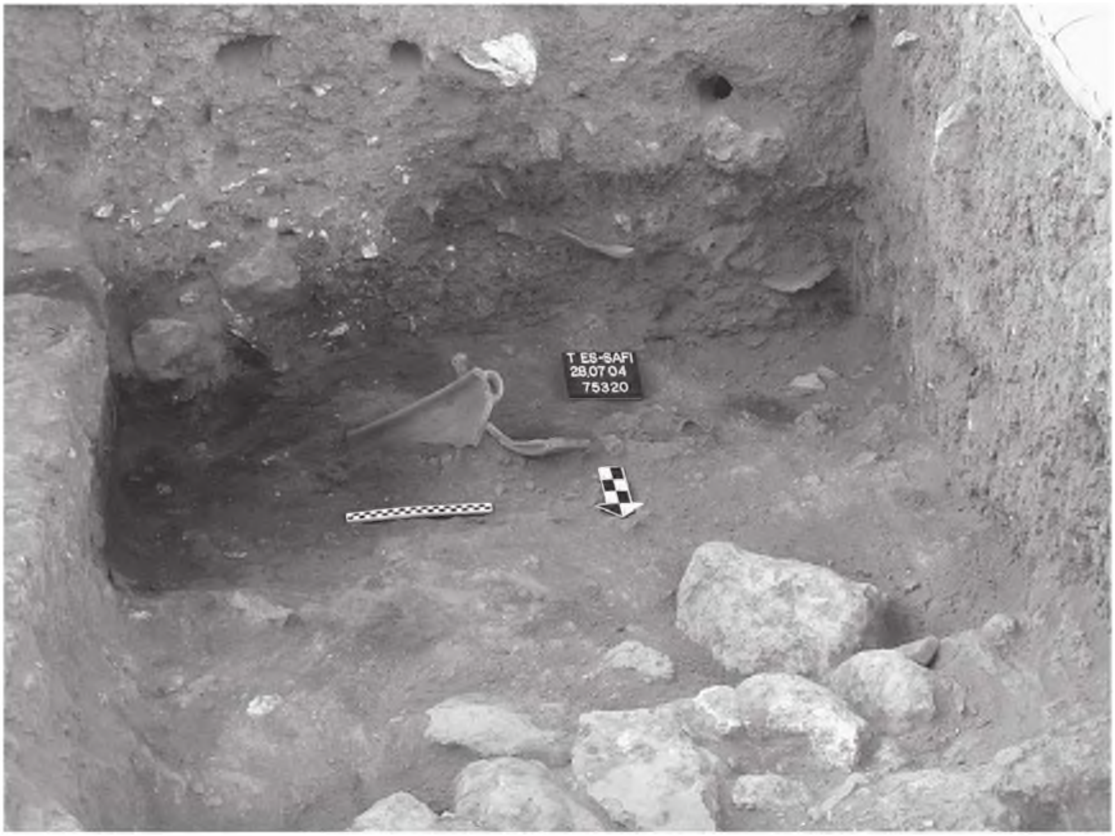

Fig. 9. Basalt stone-grinding apparatus installation (locus 95203) of kitchen-bakery 85250, temporary Stratum F8 (view with south at top).

working would have knelt and 50 cm wide at the opposite end, which featured a thick lip. One hand-held grinder, found lying in place parallel to the larger stone on its right hand or west side, measured 15 × 50 cm and was obviously for use with both hands. A smaller hand-held grinder, measuring only 15 × 20 cm, was found on the left hand or east side of the larger stone. Restorable fragments of four large storage pots were found on the north and west side of the grinding installation, all of Iron IIB Judahite style. Pieces of a very large, restorable seven-handled barrel pithos (Locus 95202) were found on the east side of the installation. These vessels likely held grain that was ground into flour on the installation. Perhaps, one or two might have held water and olive oil, used for mixing bread dough. A complete Iron IIB dipper juglet, probably for dipping liquids from the jars, was found lying just south of the installation and the large barrel pithos, along with a smaller juglet of Phoenician Black-on-Red style (Schreiber 2003). The installation and its associated pottery seem clearly to have been used for the grinding of a large amount of flour and the mixing of a large amount of bread dough.

Two meters east of the grinding installation, another curious installation of fieldstones was partially recovered (some of it remaining unexcavated in the east balk of square 18-B). This installation (Locus 95205) was rectangular in shape and abutted the north side of the north terrace wall (fig. 10). It measured about 1.5 m north-

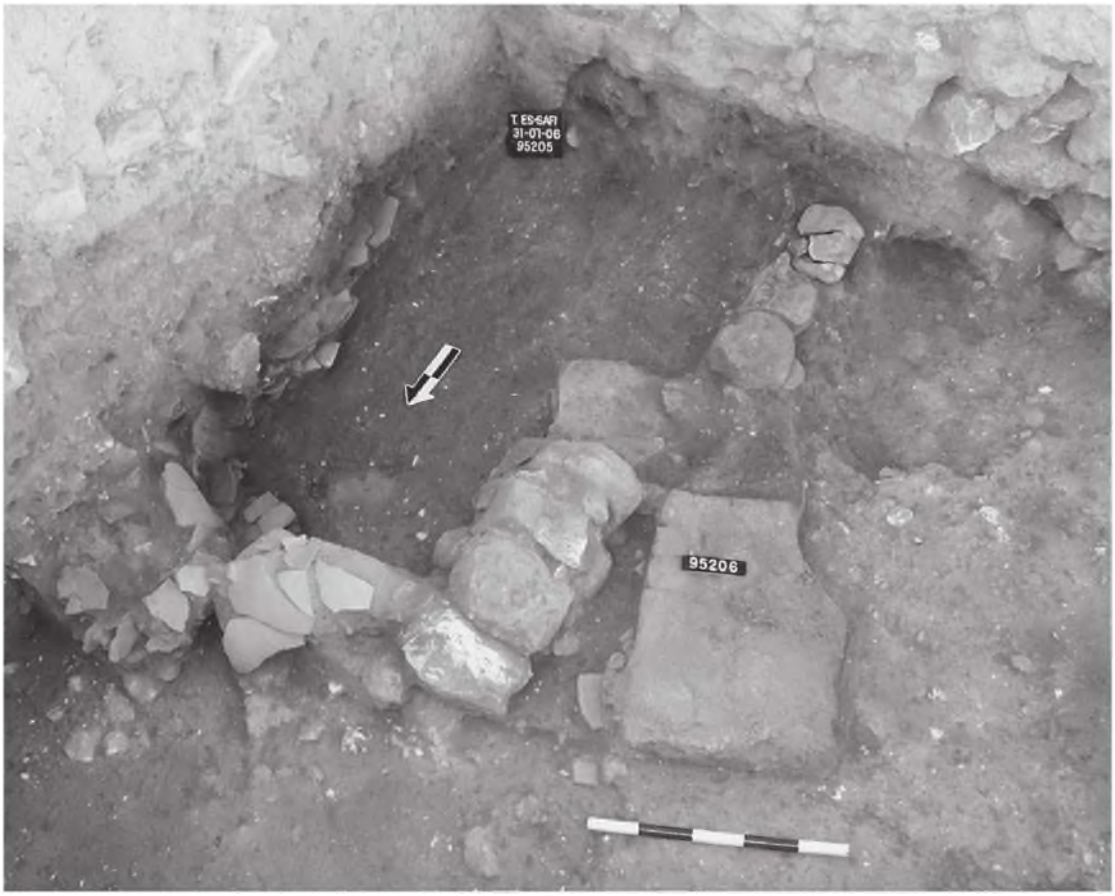

Fig. 10. Installation 95205 and implement 95206 of kitchen-bakery 85250, temporary Stratum F8. This installation may have served as a baking and cooking hearth, and the rectangular implement may have been a tray used for baking.

to-south and contained fragments of a cooking pot and a ceramic platter as well as a large amount of very dark, ashy soil. The stones of the terrace wall where the installation abutted it were scarred dark, presumably by fire or heat. Just west of this installation, a very curious feature was also discovered—a flat rectangular implement measuring about 40 × 55 cm that totally disintegrated upon the attempt to excavate it. This implement (Locus 95206) lay on top of a flume of ashy soil extending out the west side of the stone installation. The exact function of this stone installation and rectangular implement are not yet fully understood. The field supervisor suggests that the installation was an open-air hearth for cooking and baking and that the implement was a baking tray of a material that was subjected to repeated heating and cooling. It is also possible that the installation was a storage magazine for pottery used in the kitchen-bakery area in general.[5] Further research on the nature of the installation is underway.

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[5] For baking in the Iron Age Israelite/Judahite culture, see Ebeling and Homan 2008.

As already noted, kitchen-bakery 85250 was determined to belong to Stratum F8, the earlier of the two 8th-century-B.C.E. strata. A packed-earth surface had covered up the two installations and the pottery of the kitchen at a level some 20 to 30 cm above, and a much smaller stone installation was discovered on this surface, abutting the terrace wall, in which an intact Iron IIB hole-mouth jar was found. Since both surfaces were Iron IIB phenomena, the upper surface, chronologically the latest, was necessarily assigned to Stratum F7, which dictated that the earlier surface below it, with its associated kitchen-bakery, be assigned to Stratum F8.

The Succession of Events in F8 and F7

Following the destruction of Philistine Gath, the 8th-century-B.C.E. construction activity in Area F seems to have occurred in Strata F8 and F7 in the following succession:

1. [Second half of 9th century B.C.E.] The Iron IIA Philistine structures of Stratum F9 were destroyed and lay abandoned for several decades (Stratum F9 is parallel to Stratum A3 in Area A). During these decades, the ruins of Philistine Gath decayed and collapsed.
2. [Mid-8th century B.C.E.] Judahite activity at the site commenced. The first construction in Stratum F8 was the terrace wall built in Area F to surround and cover collapsed Philistine ruins. The new terrace area was filled in to provide a podium for new house construction.
3. [Mid-8th century B.C.E.] The Judahite-style (four-room style) "terrace house" was constructed on the new terrace surface, continuing Stratum F8. A kitchen-bakery was set in place on the north side of the "terrace house," adjacent to the north terrace wall (lower in elevation than the "terrace house" itself). An empty lot was located on the west side of the "terrace house," also lower in elevation: it would become a place where broken pottery and other rubbish was strewn (ceramics similar to Lachish III finds, indicating second half of 8th century B.C.E.).
4. [Late 8th century B.C.E.] An event occurred that brought an end to occupation in the Stratum F8 "terrace house" and an end to the use of the F8 kitchen-bakery north of the "terrace house" (more on the nature of this event will be said below).
5. [Later 8th century B.C.E.] The "terrace house" was reoccupied, resurfaced, and to some extent remodeled, commencing Stratum F7. The area of the kitchen-bakery was completely covered with soil, creating a new surface, and a much smaller and more-modest kitchen installation was built against the north side of the north terrace wall (ceramics also similar to Lachish III).
6. [Later 8th century B.C.E.] Below the west terrace wall, in the empty lot, the "rubbish surface" was covered with 20 cm of soil, creating a new surface. The "lower house" was built, in Judahite (four-room) style, utilizing the west terrace wall as the base of the eastern wall of the house (ceramics also similar to Lachish III finds).
7. [End of 8th century B.C.E.] An event occurred that brought an end to occupation in the Stratum F7 "terrace house" and "lower house," resulting in the destruction and burning of a portion of the "lower house" (more on the nature of this event will also be said later).

Household Archaeology and the Historical Record

Principles of household archaeology, including the recognition of specific domestic pottery types that can be securely dated to the Iron IIB horizon, allow the material culture of the "terrace house," the "lower house," and the kitchen-bakery of Area F to be identified as Judahite rather than Philistine and also allow the two distinct strata (F7 and F8) both to be dated to the 8th century B.C.E.[6] Since reliable historical allusions from biblical records suggest that neither stratum can be dated earlier than the mid-8th century B.C.E., how can the two distinct strata be accounted for? What was the terminal event of the earlier stratum (F8), and how is it that the later stratum (F7) developed so quickly thereafter? And what was the terminal event of the later stratum? It is here that information from ancient Assyrian records may provide answers.

The so-called display inscriptions of the Assyrian king Sargon II recall that he attacked Gath as part of his 712/711 B.C.E. campaign against the coastal Philistine city of Ashdod and its surroundings, which were controlled by a local Philistine monarch named *Yamani*.[7] Sargon's text reads:

> The city of Ashdod, the city of Gath {*gimtu*}, the city of Ashdod-yam I surrounded, I captured; his {*Yamani's*} gods, his wives, his sons, his daughters, the property, the possessions of the treasury of his palace, with the people of his land, I counted as spoil. I re[organized] those cities anew. People of lands of the conquest of my hand that are in the midst of the ex[tremity? of the] sunrise I [settled] within (them). [My eunuch as governor I placed over them.] I reckoned them as Assyrians; they pulled my harness. (Translation from Rainey and Notley 2006: 237)

To answer why Sargon would include an attack on Gath, which was a Judahite town at the time, in his campaign against the Philistine city of Ashdod, we must consider the following important circumstances. The Hebrew Bible (2 Chr 28:18) reports a Philistine attack on certain Judahite border-towns as far east as Socho during the reign of Judahite king Ahaz (ca. 735–715 B.C.E.). This attack probably saw Judahite Gath come under Philistine political control in the later years of Ahaz's reign. Thus, Sargon's 712/711 B.C.E. attack on Ashdod and Gath most probably was an operation against on the Philistine city of Ashdod and the Judahite town of Gath, which had recently been wrested from Judah's control by *Yamani* of Ashdod (Younger 2002: 315) and thus was under the direct rule of Ashdod.

Because Sargon's report claims that the inhabitants of Ashdod and Gath became "spoil," it is likely that that at least some of the people were deported from these cities. The abandonment of the Stratum F8 "terrace house" may reflect a deportation of that stratum's Judahite inhabitants. And the different way in which the structure was used during Stratum F7 (including the burial of the kitchen-bakery, the burial and disuse of the pillar-base, and the fill soil used to construct a new stamped earth surface) seems to indicate that new Judahite inhabitants came to the site after the termination of Stratum F8. Additionally, the way in which the implements and vessels of the Stratum F8 kitchen-bakery were left neatly in place by the last persons to use them (the upper grinding-stone had been laid precisely in its position parallel to the lower grinding-stone) may also reflect that the users of that facility were suddenly taken from the site.[8]

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[6] For comments on the differentiation between coastal/Philistine and inland/Judahite material culture in various phases of the Iron II, see Gitin 1989: 50–51; 1997; 1998 [for Iron Age IIB]; and Shai and Maeir 2008 [for Iron Age IIA].

[7] Although this campaign is usually dated to 712 B.C.E., Fuchs (1998: 85–88; see also Cogan 2008: 103) argues for a 711 B.C.E. date. For recent summaries and discussions of Sargon's campaign, see Cogan 2008: 103–5; Younger 2002: 313–18.

Another Assyrian record, the so-called "Letter to God," a text usually attributed to the Assyrian king Sennacherib (Frahm 1997: 230; Na'aman 1974; Younger 2002: 316–18; Zukerman and Shai 2006)[9] and dedicated to the Assyrian deity Ashur, describes an Assyrian attack on a city near the Judahite fortress of Azekah. According to the letter, the city had been a Philistine possession but had been taken over by the Judahite king Hezekiah (ca. 715–687 B.C.E.), an event that probably took place after the death of Sargon II in 705 B.C.E. The name of the city is not clear in the text and is denoted as a GN (geographical name) in the restored part of the translation below. The relative position of the city in terms of the historical geography of the region is very likely to have been Gath (Na'aman 1974; Rainey and Notley 2006; Zukerman and Shai 2006). The "Letter to God" text is as follows:

> The city of Azekah, his stronghold, which was between my [bo]rder and the land of Judah [. . .] situated on top of a mountain peak like iron knives without number, high as the sky [. . .] . . . rivaling the highest mountains, to the sight of the eyes, as if from heaven. [The city of GN, a] royal [city] of the land of Philistia which Hezekiah (?) had taken over and had fortified it [. . .] (Translation from Rainey and Notley 2006: 242–43)

In this text, the city of "GN" was situated on a lofty mountain and seems to have been in some proximity to Azekah. Both of these factors were true of Gath, located directly west of Azekah; indeed, the high hill on which Gath was built is clearly visible from Azekah. There are scholars who favor Ekron as the "GN" of the "Letter to God" (Galil 1992, 1995; Mittman 1990; Na'aman 1994).[10] In our opinion, however, their arguments are unconvincing from a historical-geography standpoint. In the late 8th century B.C.E., Ekron was a small city, only about 10 acres in size, situated on a very low-lying tell (Gitin 1998: 167), which hardly fits the description in the text (as noted by Younger 2002: 317–18, n. 91). Since it was most likely Sennacherib who attacked "the city of GN," then this almost certainly occurred during his 701 B.C.E. campaign against Judah in the fourteenth year of Hezekiah's reign (2 Kgs 18:13), described, among other places, in the famous cuneiform document called the "Rassam Cylinder of Sennacherib" (Cogan 2008: 111–27) and also referred to in parallel biblical narratives (2 Chr 32:1, Isa 36:1; see also Cogan and Tadmor 1988: 223–45; Gallagher 1999; Gonçalves 1986). These accounts allude to every city of Judah, except Jerusalem, being attacked and destroyed and the surviving inhabitants deported east to other Assyrian territories. The town of Judahite Gath seems to have been among 46 cities Sennacherib claims to have destroyed.

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[8] The resettlement and reorganization of cities spoken of by Sargon probably refers primarily to Ashdod and its nearby neighbor Ashdod-`yam, the major focus of Sargon's campaign against Yamani. No evidence of any occupation by peoples other than Judahites has been found at Gath.

[9] While there are scholars who attribute the "Letter to God" to Sargon II (Cogan 2008: 107–9; Galil 1992, 1995; Tadmor 1958: 80–85), the relative stratigraphy and chronology of Gath also suggest Sennacherib as the more likely author of the document.

[10] Cogan (2008: 109) raised doubts about whether either of these two sites fit, since, in his opinion, "it is difficult to reconcile the topography in the text with the location of these two sites." As we have noted here, the topographic location and character of the site of Tell es-Safi/Gath does in fact fit very well with a description as a very high mountain, particularly in relation to surrounding areas.

Until recently, there was uncertainty on how Assyrian accounts of attacks on Gath by both Sargon II and Sennacherib should be understood. The uncertainty involves the question of the identity of *gimtu* in Sargon's report of the 712/711 B.C.E. campaign. The general view—if it may be said that there is a general view—is that this *gimtu* in fact refers to Gath (Tell es-Safi). But this general view does not account for the "Letter to God" document of Sennacherib. A recent study by Zukerman and Shai (2006), however, does take the "Letter to God" into account and offers a different site for the attack by Sargon. The authors propose that the *gimtu* mentioned by Sargon was not Tell es-Safi/Gath but rather an ancient town known in Hebrew as *Gittaim*, located well northwest of Ashdod and well north of Tell es-Safi/Gath on the eastern outskirts of modern day Ramleh, at the ancient site of Tell Abu Hamid. They based their theory on the fact that only a single Iron IIB stratum was discerned in Area A at Tell es-Safi/Gath during the 1997 through 2002 excavation seasons. The authors (Zukerman and Shai 2006) believed that the "Letter to God" was indeed to be attributed to Sennacherib, that the city "GN" in the "Letter to God" was indeed Gath, and that the single phase of Iron IIB in Area A at Gath was terminated by Sennacherib's 701 B.C.E. attack. But because they knew of only one 8th century B.C.E. phase at Gath, they reasoned that the *gitmu* attacked earlier by Sargon (712/11 B.C.E.) could not have been Gath and thus suggested that *gitmu* must have been *Gittaim*. Their conclusion, however, was reached before the Iron IIB stratigraphic situation in Area F at Tell es-Safi/Gath had become clear.

On the other hand, in his thorough study of the same year, Anson Rainey maintains that Gath at Tell es-Safi was indeed attacked twice, that the *gimtu* of Sargon's report was indeed Gath at Tell es-Safi, and that that the "Letter to God" document of Sennacherib likewise referred to Gath at Tell es-Safi (Rainey and Notley 2006). Rainey had also reached his conclusion before Iron IIB stratigraphic information from the Tell es-Safi/Gath excavations had become available.

Now that the stratigraphic picture in Area A has been supplemented by findings derived from household archaeology in Area F at Tell es-Safi/Gath, it appears that Rainey's view is the perspective actually supported by the archaeological evidence. The household archaeology of the "terrace house" and the "lower house" clearly shows that there were two Iron IIB phases of 8th century B.C.E. occupation in Area F (Strata F7 and F8), both displaying a typical Judean-oriented material culture. Judahite Gath seems indeed to have been attacked by Sargon in 712/711 B.C.E., resulting in the end of Iron IIB Stratum F8, which had been in existence since about the middle of the 8th century B.C.E. Within just a few years after that attack and deportation, the area was revived and resettled by the Judahite king Hezekiah, as represented by Iron IIB Stratum F7. And, remarkably, household archaeology reveals that Judahite Gath was again attacked and destroyed in the campaign of Sennacherib in 701 B.C.E.

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Household Archaeology in the Southern Levant:

An Example from Iron Age Tell Halif

James W. Hardin

Household archaeology came into its own during the more mainstream anthropological archaeology movement as it was practiced in the New World in the 1970s and 1980s, a time when it enjoyed a period of intense development in methodological and theoretical concepts and the emergence of a number of working approaches. During this same time, however, household archaeology was largely ignored by archaeologists working in the southern Levant, even as many domestic areas were being excavated at sites such as Beer Sheva (Y. Aharoni 1973), Batash/Timnah (Kelm and Mazar 1995), Gezer (Gitin 1990), Izbeth Sartah (Finkelstein 1988), and Masos. Instead, attention continued to be paid to remains left by political and religious authorities and elites, including monumental constructions such as palatial and storage complexes, cultic areas, cemeteries, and fortification systems. This trend began to change in the 1990s as Levantine archaeologists increasingly realized that to fully understand ancient settlements it is necessary to investigate the structures where the majority of the population lived.

As it turns out, the archaeological record of the southern Levant is ideal for studies in household archaeology. One of the main reasons for this is the rich nature of the record—one that includes well-preserved archaeological remains and an intense history of archaeological investigation yielding numerous examples of houses from many periods. An additional reason is the existence of many local sources of data available for reconstructing ancient households in addition to the archaeological record. These include, especially, biblical and extrabiblical historical sources and abundant ethnographic and ethnohistoric data.

In this chapter, I will bring to bear many of these sources to gain a better understanding of the households of ancient Judah. I will do this by focusing on the remains of a single house excavated at Tell Halif, a small tell located in the northern Negev of southern Israel (fig. 1). This house, referred to as the F7 Dwelling, is well-preserved in a destruction stratum dating to the later Iron II (late 8th century B.C.E.). The house is a "four-room house," the most common type of domestic structure in the southern Levant during the Iron Age (ca. 1200–586 B.C.E.). Although the four-room house is most often understood as having been occupied by a nuclear family (e.g., Shiloh 1970, 1978; Stager 1985), I hope to show that this is not necessarily

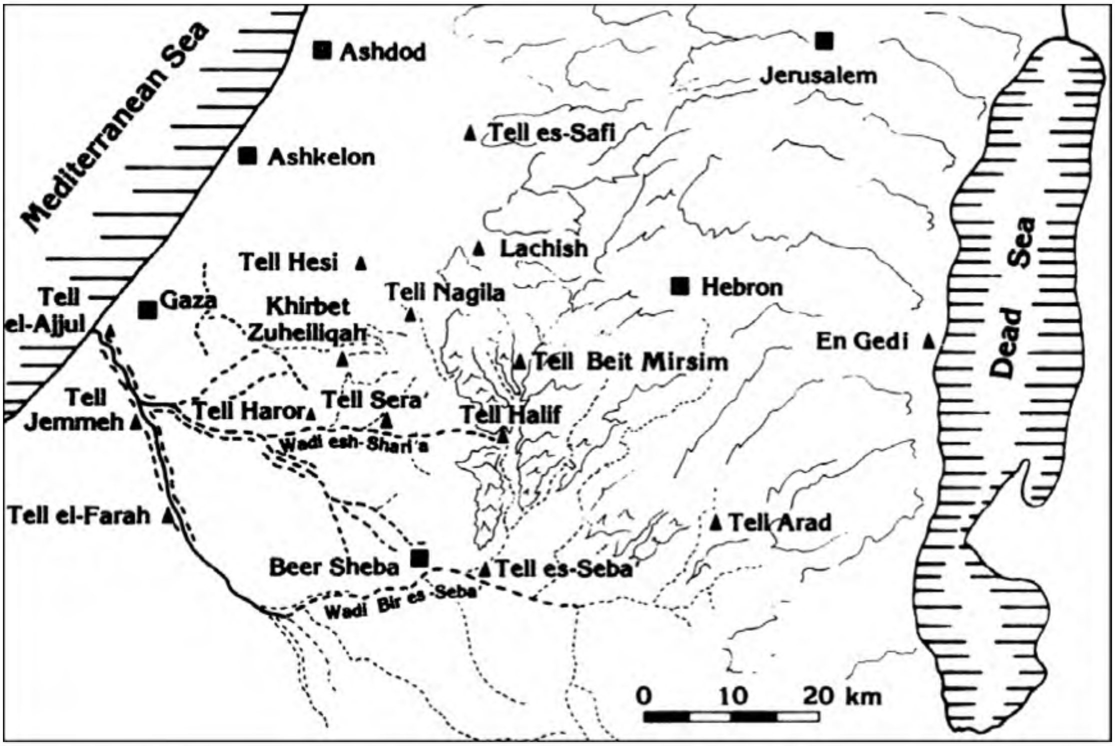

Fig. 1. Map of southern Israel, showing the location of Tell Halif (all images are courtesy of the Lahav Research Project).

the case, because some four-room houses, including the F7 Dwelling, likely were occupied by larger units, perhaps the extended family referred to in biblical texts as the *bet ʾav*. A spatial analysis of the artifacts from the F7 Dwelling demonstrates that a full range of domestic activities took place in the dwelling, and these activities are largely consistent with those performed by extended families quite typical of the eastern Mediterranean and also described in the Hebrew Bible. Additionally, the spatial analysis suggests to me, as I demonstrate below, that the occupants of the house were integrated into an economy that is more regional than is often assumed for small towns in peripheral areas of Iron II kingdoms of the southern Levant.

My intent here is to demonstrate the great potential a single house may provide for better understanding aspects of Iron II society in southern Judah during the late 8th century B.C.E. In this specific case, careful analysis of the F7 Dwelling leads to a better understanding of organization and identification of the dwelling's occupants and their economic integration into not only the small, fortified town in the southwest border regions of Iron II Judah but also the greater region. Before discussing the F7 Dwelling and its archaeological investigation, "household" and "house" is defined and the types of data available for addressing Levantine households and employed here are addressed briefly.

Household, as used here, is a culturally defined, activity-oriented domestic unit (Carter and Merrill 1979) that is co-resident (Horne 1982; Kramer 1982a: 673; Laslett 1972: 1; Netting et al. 1984: xxvi–xxviii). It is composed of three elements: (1) the social, (2) the material, and (3) the behavioral. The social unit, or the demographic unit, identifies the number of members and the members' relationships, extended or nuclear (Laslett 1972: 28–34; Hammel and Laslett 1974). This may include visitors, captives, servants, apprentices, laborers, lodgers, and boarders in addition to blood relatives and adopted members as occupants of its bounded residential space (Kramer 1982a: 666; Netting 1982: 642–43). The material unit (2) includes the house, activity areas, and possessions. The behavioral unit (3) includes the activities in which the household engages (Wilk and Rathje 1982: 618), including some combination of production, distribution, transmission, and reproduction (Wilk and Netting 1984: 5). Here I attempt to elucidate the household occupying the F7 Dwelling by clarifying as many facets as possible of the three elements—social, material, and behavioral. *House* as used here is the physical setting, or the domestic space, occupied by the household.

The Levantine Archaeological Record

The quantity of archaeological work undertaken in the Levant, particularly the southern Levant, is truly remarkable when compared with other areas of the world. From the Iron Age, we have a great deal of archaeological data to draw upon for household study. This includes numerous partial houses, complete houses, entire domestic areas/quarters, and even nearly complete town and city plans. The quality of these remains also can be impressive, because many houses are preserved well above floor levels, sometimes even to the level of door lentils, with many artifacts still located in the remains of the houses. Often, their excellent preservation is due to the sudden way they entered the archaeological record as a result of a catastrophic event.

A common phenomenon quite unique to the eastern Mediterranean and especially the Levant is the ubiquitous destruction stratum so prevalent in many types of sites but epecially tells. These strata usually represent the remains left after military conflict, accidents, or natural disasters, especially seismic activity. Some examples of strata from sites where large archaeological exposures attest to the enormity and totality of settlement destruction associated with military activity include Arad XI, IX, VIII (M. Aharoni 1993: 82; Herzog 1984, 1997); Ashkelon (Schloen 1997: 222); Batash/Timnah VI and III (Kelm and Mazar 1995: 13); Beer Sheva II (Y. Aharoni 1973); Beth-Shean IX, VII, VI, and IV (James 1966; Mazar 1997); Beth Shemesh III ("Red Burnt" stratum) and IIc (Grant 1931, 1932, 1933; Mackenzie 1911, 1912–13); Tell Beit Mirsim C, B1, and A (Albright 1943: 36, 65–68); Gezer XVIII, X, V, and VI (Dever 1997); Hazor XVI, XIII (upper), 1a (lower), and IV (Ben-Tor 1997; Yadin 1975); Lachish Levels III and II (Tufnell 1953: 56–57); Megiddo IX, VII B, and VIIA (Loud 1948; Ussishkin 1997a); and Tel Miqne/Ekron VIII and IB (Dothan and Gitin 1997).

Other destructions identified as the result of earthquakes at sites in the southern Levant include: Jericho at the end of the MB IIC (Holland 1997: 3, 223), Tel Michal Stratum XVII at the end of the MB IIB (Herzog 1993: 1036–1037), and at Tell el-ʿUmeiri ca. 1200 B.C.E. (Herr and Clark 2001: 41). Several destructions that date to the mid-8th century B.C.E. have been associated with the earthquake mentioned in Amos 1:1 and Zech 14:5 as occurring during the reign of King Uzziah. These include Gezer (Dever 1992), Haror (Oren 1997: 476), Hazor Stratum VI (Barkay 1992: 328; Ben-Tor 1997: 3–4; Mazar 1990: 412), and Lachish Level IV (Barkay 1992:

328; Ussishkin 1997b: 320). Additionally, Siqmona's destruction in the first part of the fifth century B.C.E. has been attributed to an earthquake (Elgavish 1997: 5:36). This list is not exhaustive. Through a perusal of an archaeological encyclopedia of the southern Levant, I was able to identify 134 destruction strata, attesting to the commonness of site-wide destructions in the southern Levant (Hardin 2010). More than half of the destructions included in this list date to the Iron Age II. Site-wide destructions, where settlements are burned or otherwise destroyed and covered over rapidly before the site is reoccupied, preserve in their destruction debris largely intact systemic inventories, including complete or restorable artifacts usually left in behavioral context—that is, in or near their use locations. When the locations of these assemblages of artifacts—referred to here as *de facto* refuse—are carefully mapped within domestic contexts and when patterns introduced by natural and cultural formation processes are accounted for, these assemblages become invaluable for understanding household activities.[1] The retrieval of similar information from the floors of domestic structures yielding few or no systemic artifacts is aided by recent advancements in soil chemistry studies and microdebris recovery techniques and analyses. Thus, the Levantine archaeological data available for household investigations are rich in both quantity and quality.

Other Sources of Household Data

In addition to a rich archaeological record, we are fortunate to have other useful sources for understanding ancient households, particularly the textual/historical record and the ethnographic and ethnohistoric record.

Textual Data

Using texts to understand ancient household organization has a long history in biblical studies (Gottwald 1979; Levine 2003; Meyers 1991; Perdue et al. 1997; Wright 1979, 1992) as well as the broader Near East in general (Mendelsohn 1948) — from Egypt (Pinch 1995), to Syria-Palestine (Kempinski and Na'aman 1973; Levine 2003; Schloen 2001), Anatolia (Imparati 1995), and Mesopotamia (Dercksen 2004; Larsen 1976; Stone 1987, 1996; Tricoli 2006; Westbrook 1991). Texts useful for understanding households extend back more than four millennia in many parts of the Near East, and they have been used to identify households and individual household members, reconstruct household organization, identify the activities households are involved in, investigate the way household activities are organized, and understand households' relationships to other social institutions and economy.

Some texts used for reconstructing households date later than the events they describe (e.g., biblical texts). Others are archaeologically derived and contemporary with, as well as geographically near, the archaeological data used for reconstructing households such as economic records and court histories. With regard to archaeology, textual sources provide excellent data for establishing links between the material record and social structure. When archaeological and textual sources are used together, they may provide important support or correctives for one another (Meskell 1998; Naʾaman 2009; contra Yoffe and Crowell 2006). While the value of textual data to archaeologists is regarded as notable by most scholars, there is less agreement regarding the similar usefulness of ethnographic data.

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[1] It should be stated that what is reflected in *de facto* refuse from destruction strata may be something other than normal daily activities. Long-term sieges or even preparation for impending short sieges likely truncated normal daily activities and use of space, thereby providing archaeological assemblages and patterning atypical of activities associated with normal life. I deal with this further in the discussion of microartifacts.

Ethnographic Data

Ethnographic and ethnohistoric data are used by archaeologists as analogues to establish links between material culture and behaviors, activity areas, and social structure. The Middle East is rich with many examples of these sorts of studies that have been used to provide rich information with which to supplement the often insufficient knowledge provided by textual evidence and archaeological data when reconstructing elements of past societies. The same spatial organization of activities observed in the ethnographic or systemic context is believed to underlie the patterning of debris recovered from the archaeological record (Brooks and Yellen 1987: 63). Therefore, many archaeologists believe, at the very least, that ethno-data work well as points of departure for testing identifications of cultural material and behavior by providing analogical materials for archeological interpretations of material culture.[2]

Although few scholars would disagree with the notion that ethnographic and ethnohistoric data are useful for understanding the more functional aspects of material culture in the past, there is less agreement with regard to their usefulness for understanding the organizational aspects of past societies—whether social, political, or economic. Some scholars have issued cautions or questioned the use of comparative ethnographic and ethnohistoric data on several bases.[3] They have questioned the value of emic and etic views/interpretations of ethnographic and archaeological data (e.g., Kent 1984, 1987; Newell 1987; Portnoy 1981; Yellen 1977b). Some scholars are critical of any implicit assumption that similarities or uniformities of social organization exist between modern cultures examined ethnographically and ancient cultures being investigated archaeologically. Scholars' criticisms are based on a problematic view of social organization as static and crystallized (Hill 1998).

A number of scholars have pointed out the neglect of gender studies in the ethnographic and ethnohistoric literature,[4] including the omission of gender as an organizing principle (Hill 1998: 101; cf. Gilchrest 1991; Stanton and Stewart 1995) as well as ignoring or paying insufficient attention to studies of women's technologies and productive tasks (see Friend 1997; McGaw 1989, 1996; Meyers 1988, 2002, 2003). Others have addressed the neglect of considering women's roles in influencing and changing social organization, assuming absolute divisions of labor between men and women, or even viewing gender roles and activities as static and uniformitarian rather than dynamic and adapting.[5]

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[2] London (2000: 3–4) cites examples of the kinds of issues addressed recently in the Middle East, including ceramic technology (Johnston 1974; Matson 1974; Rye 1981), bread and cooking-oven technology (McQuitty 1984), architecture (Aurenche and Desfarges 1985; Kamp 1993; Khammash 1986; Layne 1986), agriculture (Fuller 1986; Palmer 1998), Bedouin camp-sites (Layne 1986; Saidel 2001; Simms 1988; Suleiman 1988), tent construction (Banning and Kohler-Rollefson 1986); and animal husbandry (Geraty and LaBianca 1985).

[3] For example, Bonnichsen 1973; Classen 1992; Conkey 1993; Conkey and Gero 1991; Cranstone 1971; David 1971; Hastorf 1991; Hill 1998; Horne 1982; Kramer 1982a; S. M. Nelson 1997; Newell 1987; Stanislawski 1973; Wylie 1991, 1993.

[4] For example, Conkey and Spector 1984; Conkey and Tringham 1995; Fagan 1992; Whelan 1991a, 1991b; Wylie 1992

All of these issues are valid and important and must be kept in mind when using ethnographic and ethnohistoric data as an aid to interpretation of archaeological remains. However, numerous ethnographic and ethnohistoric studies have addressed problems inherent to studies based on analogy.[6] Others have gathered the kind of data necessary for assessing the usefulness of archaeological and ethnographic data in determining aspects of past societies.[7] Others still, including a number who have pursued ethnoarchaeological studies, have researched the location and use of activity areas to determine whether etic or emic notions regarding the use of space are accurate or even useful when attempting to reconstruct past activities.[8] The archaeological literature on this subject is also abundant.[9] Related to these studies are ethnographic and archaeological research undertaken to study male/female use of space.[10]

I believe that ethnographic and ethnohistoric resources provide rich data and cultural information with which to supplement and to understand the often insufficient information provided by textual evidence and archaeological excavations when reconstructing elements of past societies. Direct ethnographic data collected from cultures spatially and/or temporally near the study group are probably the most useful for analogy, especially when there is a strong demonstration of conservatism and continuity with the society under study. Here, these sources are used primarily to help understand the activities taking place in the F7 Dwelling and the social organization of its inhabitants.

I hope to demonstrate the usefulness of an approach that utilizes all such extra-archaeological data, using the Iron II remains from Tell Halif: inferences regarding household organization were derived from comparative archaeological data; biblical sources and other more contemporary textual sources; ethnographic and ethnohistoric studies; and the material sciences.

Household Archaeology at Tell Halif

Tell Halif in southern Israel sits atop a small hill rising approximately 490 m above sea level where the western flanks of the Hebron Mountains and the chalky hills of the Shephelah meet the foothills area of the northern Negev. The site has been excavated periodically by the Lahav Research Project since the late 1970s (Seger

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[5] For example, Blackwood 1984; Conkey and Gero 1991; Herdt 1994; Hill 1998; Meigs 1990; Meskell 1996; Moore 1993, 1994

[6] For example, Ascher 1961; Binford 1967; Dunnell 1978, 1992; Gould and Watson 1982; Salmon 1982; Wylie 1982, 1985 e.g., Ascher 1961; Binford 1967; Dunnell 1978, 1992; Gould and Watson 1982; Salmon 1982; Wylie 1982, 1985.

[7] For example, Adams 1976; Ascher 1961; Binford 1978a, 1978b; Crystal 1974; Downing et al. 1981; Gould 1974, 1978a, 1978b; Kent 1984, 1987; Kramer 1979; Matson 1974; Newell 1987; Oswalt 1967; Roberts 1965; Stiles 1977; Thompson 1974; Watson 1979; Yellen 1977a, 1977b.

[8] For example, Binford 1978a; Bonnichsen 1973; Kent 1984, 1987; Newell 1987; Portnoy 1981; Yellen 1977b.

[9] For example, Anderson 1974; Blake 1976; Breternitz 1982; Brugge 1980; Hammack 1969; Kent 1984; Newell 1987; Schiffer 1976; Watson et al. 1971.

[10] For example, Agenbroad 1978, 1982; Bourdieu 1973; Flannery and Winter 1976; Kent 1984; Meyers 2002, 2003; Yellen 1977b.

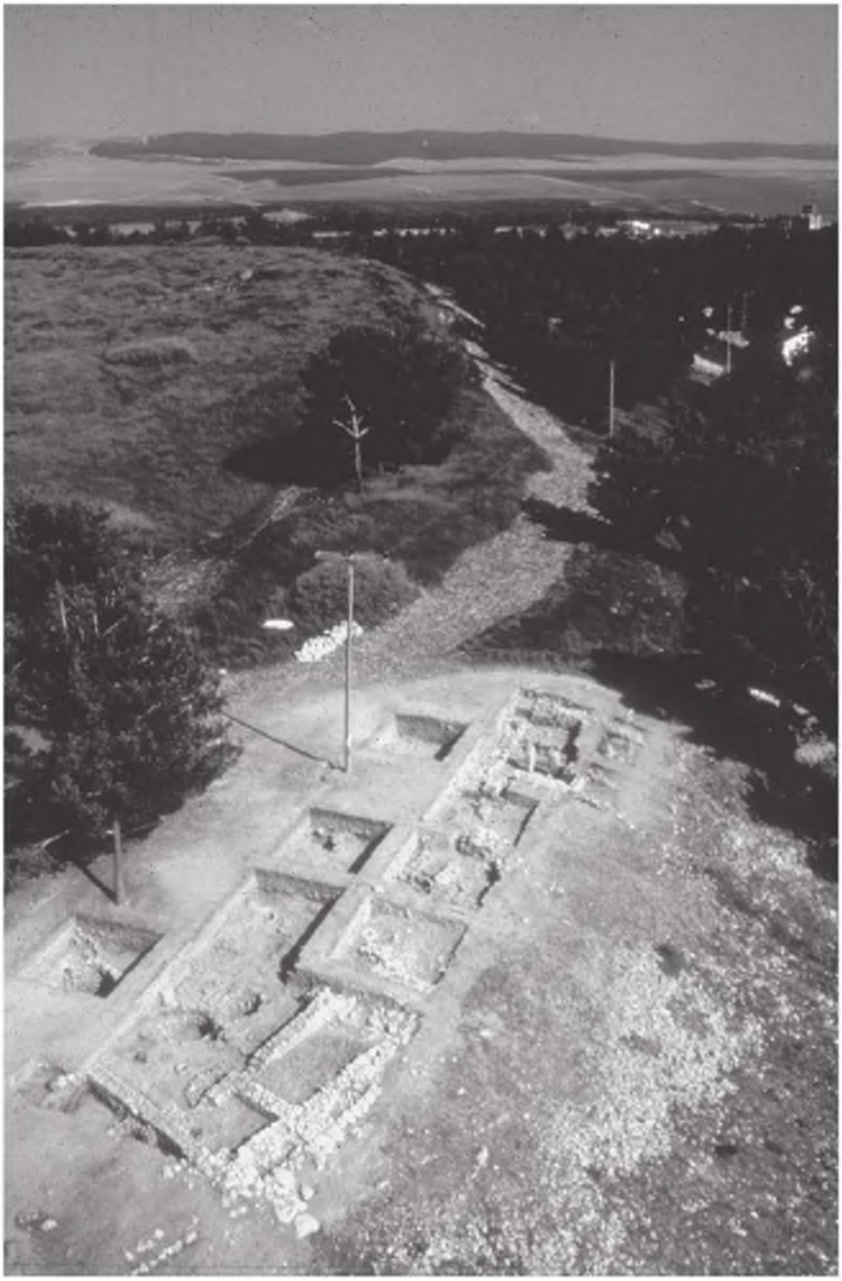

Fig. 2. Aerial view of Tell Halif's western slope. The F7 Dwelling is located on the lower left.

1993). During its Phase III excavations in 1992 and 1993, the project focused its efforts on a destruction stratum (Stratum IVB) dating to the late 8th century B.C.E.[11] This stratum, which includes the domestic remains discussed here, was exposed in broad horizontal areas along the western perimeter of the tell (fig. 2). A number of houses were discovered built against one another and integrated into a casemate wall system along the western perimeter of the settlement. All structures exposed in these areas give witness to intense burning and destruction, and their floors were covered

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[11] Phase III excavations were direct by Oded Borowski and Paul Jacobs. I am indebted to them and Joe D. Seger for the use of the Lahav data here.

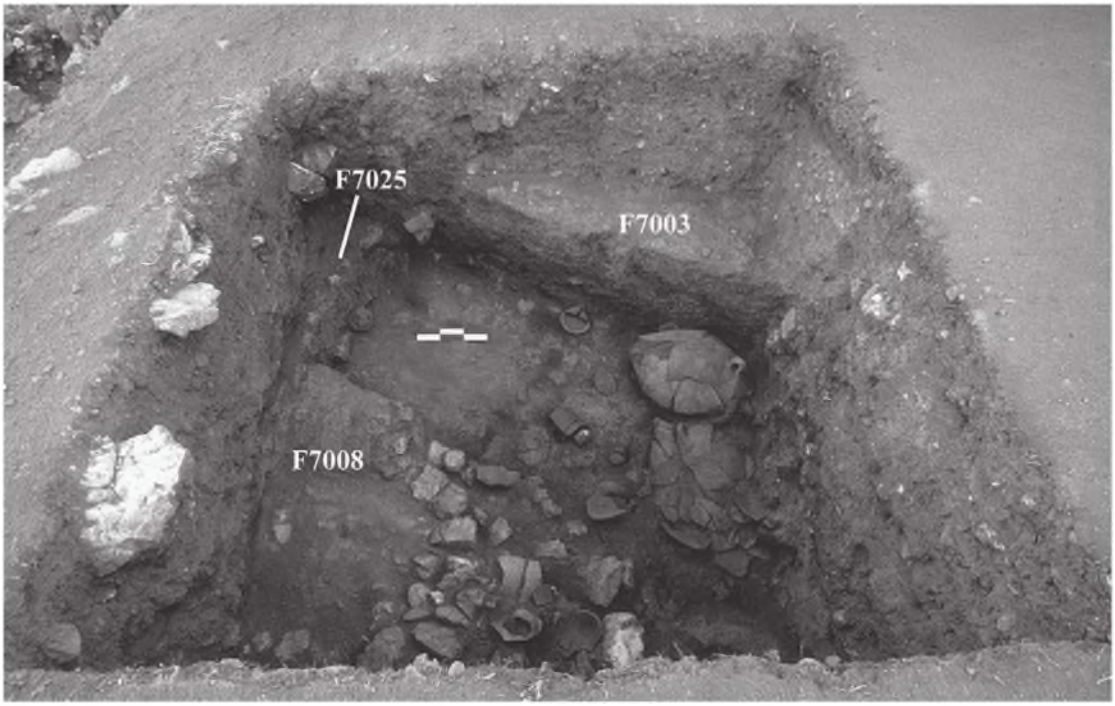

Fig. 3. Probe into Room 5 of the F7 Dwelling. The remains seen here are typical of those throughout the dwelling and include crushed artifacts covered by the destruction debris.

with large quantities of smashed or whole artifacts buried under and in the burned debris of roof-collapse and partially fallen walls (fig. 3). Arrowheads and sling-stones were found mixed with the debris, suggesting that military activity was the cause of destruction, probably to be associated with the Assyrians, who campaigned several times in the southern Levant during the late 8th century B.C.E. (Blakely and Hardin 2002; Finkelstein and Naʾaman 2004). Among all the structures fully or partially exposed, the F7 Dwelling was both very well preserved and almost entirely excavated. It therefore is a good candidate for investigating the Iron II household. Specifically, attempts have been made to identify what activities took place within the dwelling and how these were organized. It is hoped that this will lead to a better understanding of the occupants' social organization (who occupied the dwelling?) and their economic organization (was it integrated or not integrated into a local or regional system?).

The F7 Dwelling

The F7 Dwelling is of the type often referred to as a "three-room" or "four-room house."[12] It is a rectangular compound measuring east-to-west approximately 11

[12] 12. This house type became standard in the southern Levantine Hill Country and the Shephelah during the entire 600 years of the Iron Age– after which time it disappears completely—an interesting phenomenon but outside the scope of this paper. The four-room house typically ranges from 35 to 80 square m and in some examples may be more than 100 square m. The median, however, is around 40 to 50 square m (Pritchard 1985: 30–31). That it survived the demographic and socio-political changes taking place during the Iron Age (Joffe 2002; Portugali 1994) attest to the

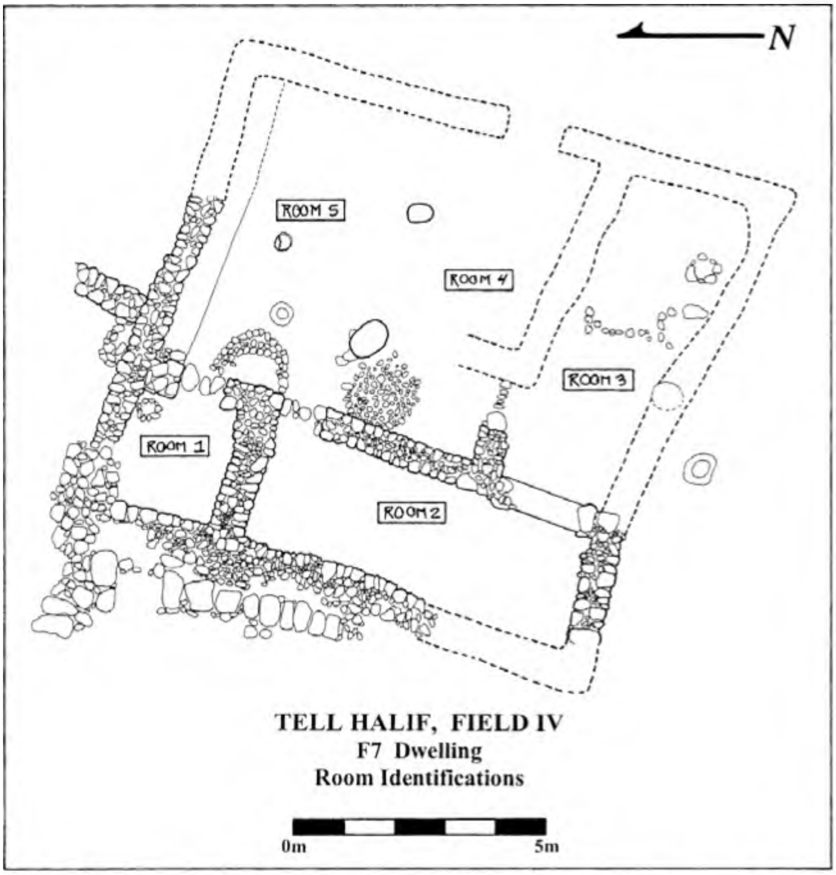

Fig. 4. Plan of the F7 Dwelling, with the identification of room designations.

to 12 m and north-to-south approximately 9.5 m (fig. 4). The dwelling's space is divided between a pair of broad rooms set across the rear of the structure (Rooms 1 and 2) and three long rooms (Rooms 3–5) extending perpendicularly through the remainder of the compound. The two broad rooms are divided unevenly, as is typical in most four-room houses, and are incorporated into a casemate defensive wall that encircled the site. Of the three long rooms, one (Room 3) is separated from the other two by a solid wall and linked to them by a doorway. The other two long rooms (Rooms 4 and 5) are separated by two or three pillars.

The walls of the dwelling were built of mud brick on stone foundations. The floors were finished either with packed earth or cobbles. Many artifacts were discovered on these floors and in the ashy debris that sealed them. These include both non-portable and portable artifacts. Non-portable features include bins made of cobbles and clay, ovens, hearths, grinding implements (mortars), and shallow stone-lined pits. Portable artifacts include weaving implements, scale weights, loom weights, "cultic" paraphernalia (figurines, standing stones), bullae, seed remains, articles of personal adornment, agricultural tools, numerous faunal remains, and 81 restorable ceramic vessels. The vessel assemblage is virtually identical to those from other sites in southern Judah dating to the late 8th century B.C.E., such as Beer Sheva Stratum II,

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success with which the house's plan and features continued to meet the needs of its inhabitants both functionally and ideologically.

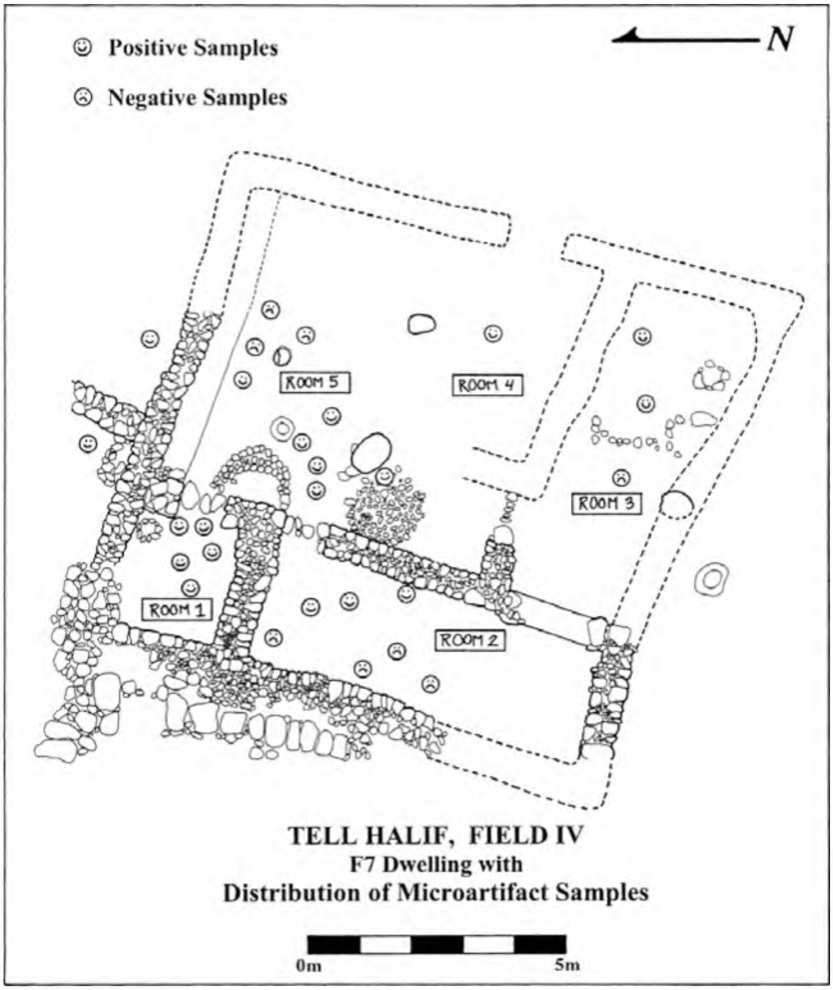

Fig. 5. Plan of the F7 Dwelling, with locations of positive and negative micoartifact samples noted.

Lachish Level III, and Tell Beit Mirsim Stratum A. This similarity suggests an integrated system of production and distribution for ceramics.

Some of the most important data collected and used to identify activities taking place in the dwelling were microartifacts collected by Arlene Rosen. Multiple samples approximately 20 cm in diameter were taken from the build-up on each floor, sifted through graduated screens for size separation (3 cm to 0.3 mm), and then analyzed microscopically. Rosen collected samples throughout the F7 Dwelling, normally away from walls (samples close to walls are less likely to contain microartifacts) and where build-up on floors was identified or suspected. Positive samples yielded microartifacts and negative samples contained none (fig. 5). Types of microartifacts recovered from the F7 Dwelling include fish bone, animal bone, cereals, legumes, eggshell, grape pits, beach rock mortar fragments, flint debitage, greenish slag, red ochre, and burned debris of various natures.

Using the microartifacts, Rosen was able to identify the location of a number of activities taking place within the dwelling. It is interesting to compare her interpretations of these diachronic data from the build-up of floors with those based on the

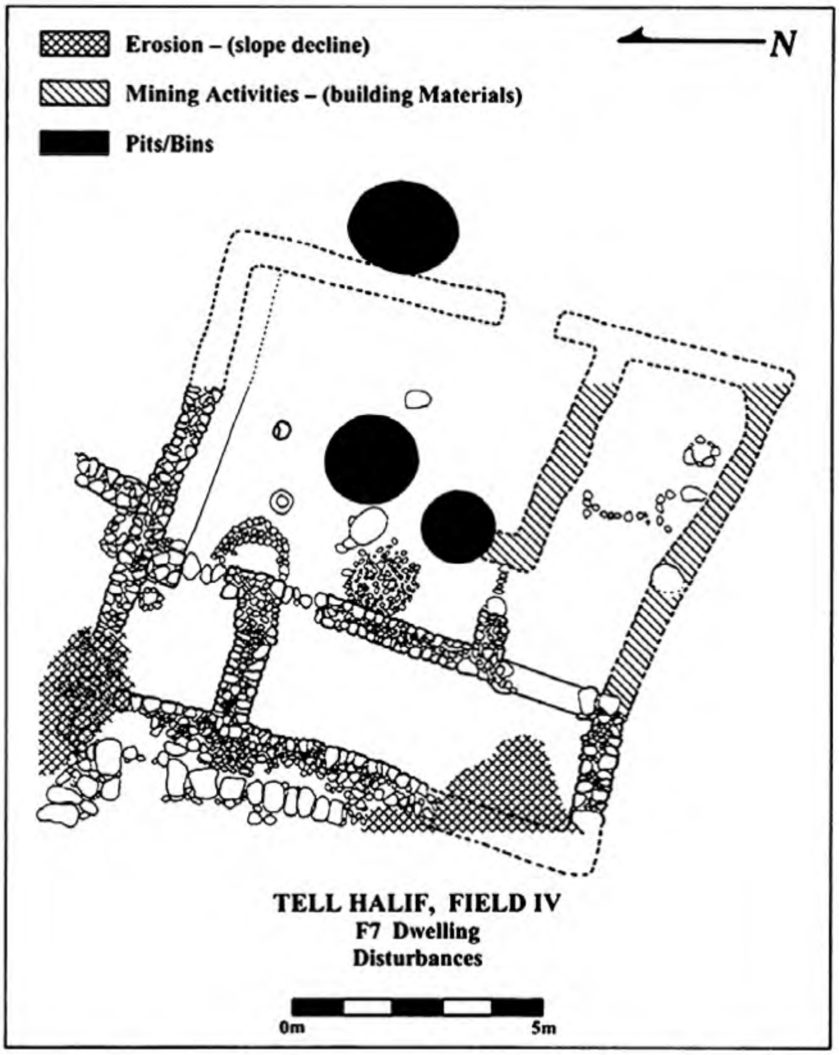
Erosion – (slope decline)
Mining Activities – (building Materials)
Pits/Bins
N
TELL HALIF, FIELD IV
F7 Dwelling
Disturbances
0m
5m

Fig. 6. Illustration of the most significant formation processes affecting patterning of artifacts within the F7 Dwelling.

synchronic *de facto* refuse. Because there is a chance that the F7 Dwelling's *de facto* refuse associated with the military destruction of the settlement may not be typical of normal daily activities, the microartifacts can provide an important corrective by bringing to light places where normal activities may have been truncated by those associated with warfare and/or siege preparations.

With regard to methodology, all artifacts from the destruction debris and the floors were point-plotted or collected and recorded in 50-cm increments. Objects were individually registered and their relationships to the floors and other non-portable features established and described. In addition, every bit of soil that came out of the F7 Dwelling was sifted and artifacts were reassociated with their 50-cm plots. All this was done to preserve important spatial data and to allow for the rigorous study of sources to avoid introducing variability and patterning into the archaeological record that were not associated with the past behaviors of the household members. Where the data could not be ruled out as introducing patterning, they were taken

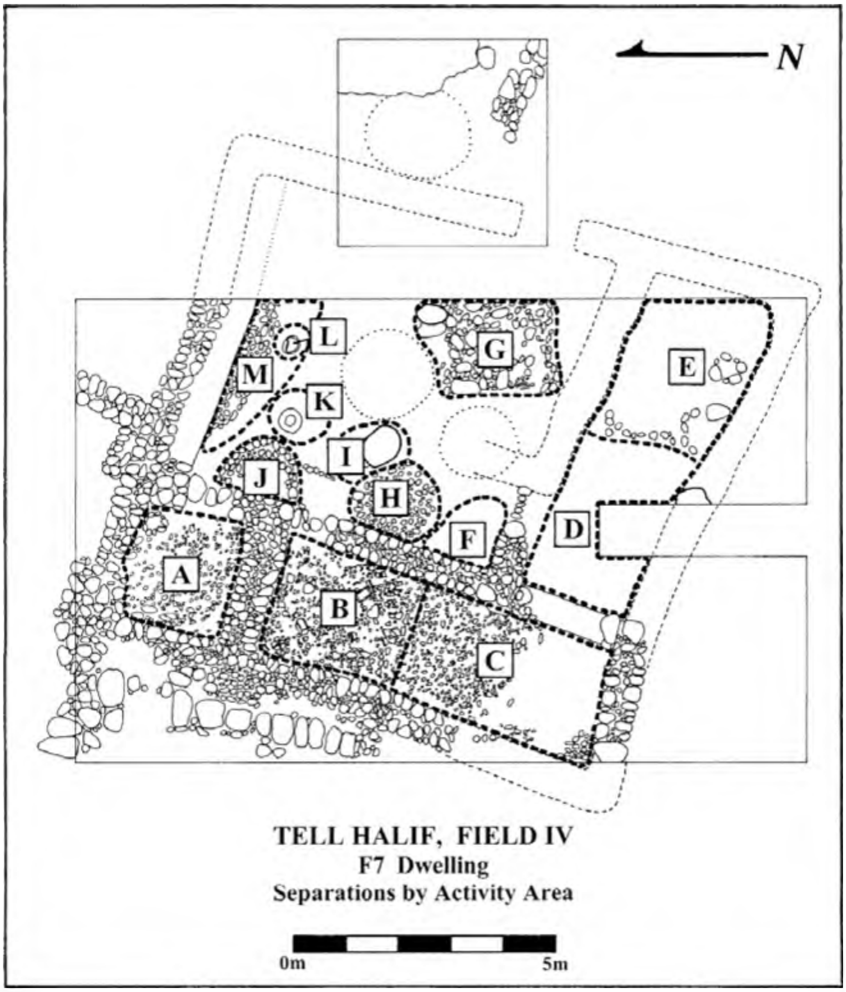

Fig. 7. Division of space into activity areas within the F7 Dwelling.

into consideration when interpreting the use of space. The most significant processes affecting the archaeological remains of the F7 Dwelling included some pitting from the Persian and Byzantine Periods, mining and robbing of walls for building materials, and some limited areas of erosion (fig. 6). Outside of these areas, remains appear largely to be associated with the places where they were located when the F7 Dwelling entered the archaeological record.

Once all of these data were processed and analyzed, I identified activity areas and inferred how the space was used, by whom, and how these people and their activities were organized. Activity areas within the F7 Dwelling are identified in terms of their composition, their relative density, number of artifact clusters and other remains, organized relationships that existed in space between architecture, features, and artifacts, and in terms of the locations and relative amounts of space utilized for each area (cf. Newell 1987: 107).

In the following discussion, the F7 Dwelling is divided according to the five rooms described above (fig. 4). Thirteen additional subdivisions were discerned within the rooms and were identified as activity Areas A through M (fig. 7). These activity areas are described and suggestions are made for their use.

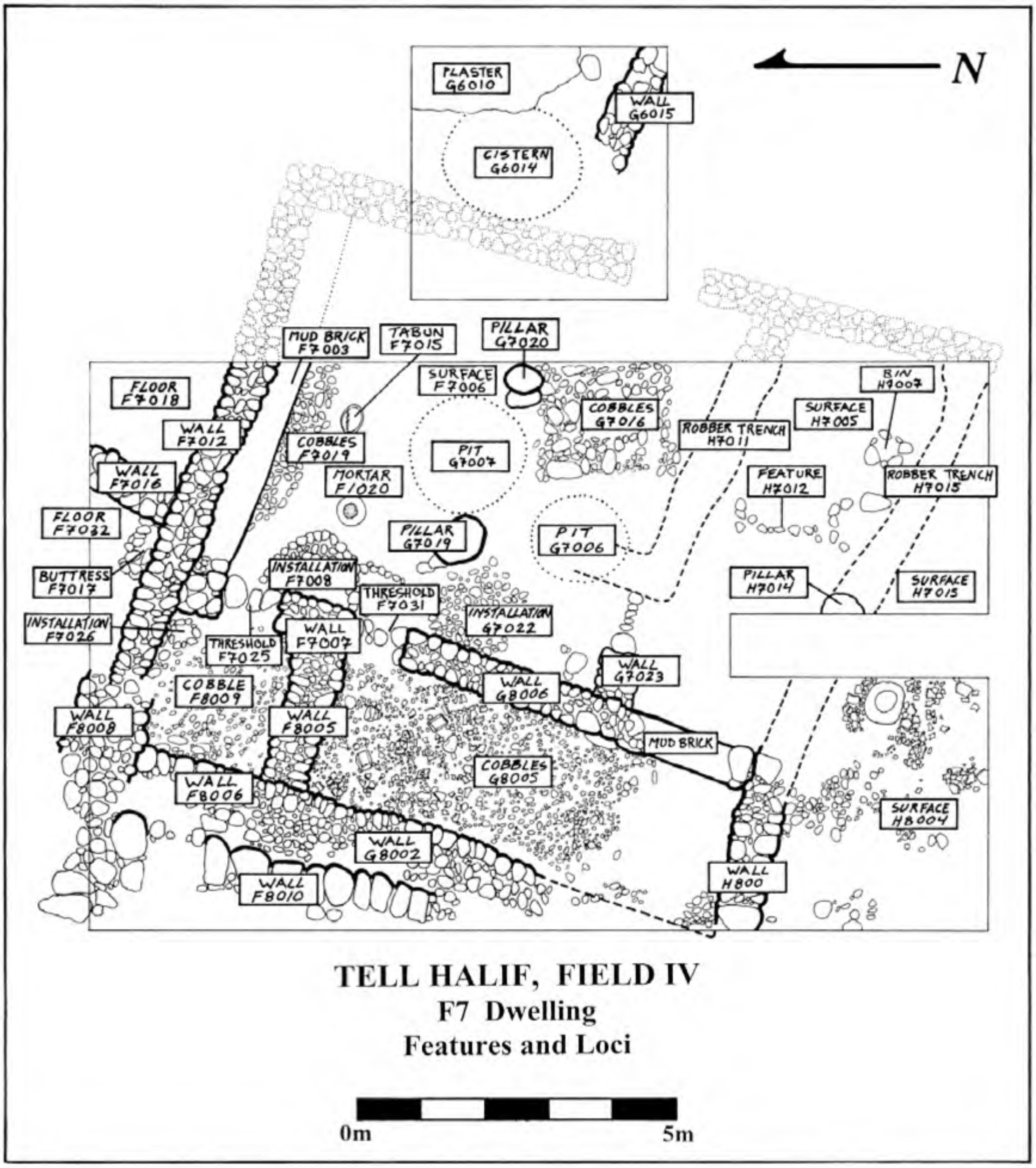

Fig. 8. Plan of the F7 Dwelling, with locus and feature identifications.

The Archaeological Remains

Room 1

Room 1 is the smaller of the two broad rooms. It is essentially square, with an inside space measuring 2.25 m × 2.4 m or 5.4 square m (fig. 4) and a floor (Locus F8009) that is well prepared with small, compacted cobbles. The floor was covered by a uniform layer of dark ash, likely the remains of the roof (fig. 8).[13] This layer was

[13] One of the few features universally agreed upon regarding the covering or otherwise roofing

5–10 cm thick and sealed below other destruction materials provided by collapsing mud-brick walls and burned debris. The lone feature in Room 1 is a raised installation located in the northeast corner, likely the base of a dismantled tabun oven (L. F7026). A 26-cm raised threshold (Locus F7025) is located in the doorway separating this room and Room 5. This doorway is the only observable access to Room 1 and is partially obstructed by a semicircular installation (Locus F7008) located in Room 5. The placement of the installation leaves only 60 cm of unobstructed passageway between the installation and the north wall. The entire space of Room 1 is comprised of one activity area—Area A. This is due to the room's small size and the lack of discernible patterns in the artifacts and other refuse.

Upon excavation, Room 1 was found filled with burned debris to a depth of approximately 35–50 cm. The debris mostly consisted of gray, brown, and black ash and fired mud bricks and detritus. Mixed with this destruction debris and lying on the floor were numerous ceramic vessels and other artifacts. Restorable ceramic vessels from Room 1 included six storage jars, two cooking jugs, two juglets, one jug, and one bowl. One pattern that was recognizable and consistent throughout the room was the placement of the large storage jars near walls, probably designed to hold the jars upright. Other classes of artifacts found on the floor include a stone scale-weight, grinding-stone fragment, and one ground stone. Microartifacts were recovered from all five samples taken from floor build-up in Room 1. The sample near installation Locus F7008 (fig. 5) in the northeast corner of the room included animal bones, cereal remains, and flint chips (Rosen 1992). Other samples taken throughout Room 1 provided, in addition to cereals and animal bones, beach rock mortar fragments, burned rodent bone, fish bone, and flint chips with sheen. Other artifacts found in the debris above the floor include a ballista, figurine fragment, and a metal knife blade.

Storage appears to have been the obvious function of Room 1, due to the numerous large jars and the relative "closeness" of space in the room. The placement of the large jars along the walls of the room would have made moving around within the confines of the room difficult. Minimal traffic in Room 1 can be inferred from the partially blocked doorway. Although the installation (Locus F7008) in Room 5 clearly impedes flow, it does not prevent passage in and out of the room. The microartifacts, however, suggest a use of the space other than storage.

The microartifacts suggest that food preparation was the main activity performed in this room, as well as perhaps one or two brief episodes of retouching of flint implements, because the flint chips were very uniform. In addition to the many cereal and bone remains found in most of the samples, a high correlation coefficient was identified by Rosen between bone and charcoal, which is highly indicative of cooking areas (Rosen 1992). These data, in addition to the two cooking jugs and a tabun, make a strong case for the room being used as a food preparation area. However, at the time when the Stratum VIB settlement was destroyed, it would have been virtually impossible to use Room 1 for anything other than storage due to the considerable number of large ceramic vessels present there. Therefore, I suggest that storage was the main function of Room 1 immediately prior to the destruction of the VIB settlement.

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of pillared dwellings is that the broad rooms were roofed (Braemer 1982; Holladay 1992a; Netzer 1992; Stager 1985).

It is impossible to know with certainty if a siege resulting in the destruction of the Halif settlement caused a temporary functional deviation for Room 1, because space was needed for surplus provisions resulting from Assyrian activity in the region, or if the change in function was long-term and not an atypical use of the room. The partially obstructed doorway fits the second interpretation better, because there would not have been as much need for access to the area if it was used for long-term storage. In addition, the burned rodent bones from the microartifacts near this stored/inaccessible space serve as a primary marker of storage areas.

Also important for understanding this space is that Assyrian records chronicle most military campaign activity as taking place during summer months (Dalley 1995: 419). Although this provides a season for the destruction of the settlement, it may also provide evidence of seasonal use of the room. It is possible that Room 1 functioned as a storage facility that did not receive heavy traffic during the summer months and as a food preparation area during the winter months. Ethnographic data from Southwest Asia is useful in this regard, because it supports dual roles for interior space based on seasonality (Kramer 1993, personal communication).[146] Carol Kramer has noted that, during the wetter winter months in southwest Asia, food preparation activities were often moved indoor, thereby providing heat and protection from the elements for those carrying out these activities. During the hot summer months, food preparation was often carried out in courtyards or other open and partially open areas. It is possible that a seasonal change in location of food-preparation provided the observed patterning in Room 1, where an oven appears to have been dismantled and moved, possibly to exterior/courtyard space. Two ovens/hearths were found in Rooms 4 and 5, where activities are consistent with those observed ethnographically as taking place in open courtyards, and this reconstruction fits well with data employed here.

Room 2

Room 2 is a long, narrow space measuring 2.4 m × 6.75 m. It is surrounded on all four sides by mud-brick walls built on stone foundations. The floor of Room 2 was treated in a manner similar to Room 1, with well-laid small cobbles. Access to the room was gained through one doorway in the eastern wall. The entryway was built with a raised threshold (21 cm high) similar to the one in Room 1. No other permanent features were found preserved in the archaeological remains of Room 2. It must be noted that the southwest corner of the room is poorly preserved due to its proximity to the west slope of the tell and the modern ground surface (fig. 6).

The depth of preserved destruction debris in this room varies from approximately 50 cm in the northeast corner to 15 to 20 cm in the southwest corner. Clean, undisturbed Iron II (Stratum VIB) loci are encountered relatively close to the modern ground surface; however, the *de facto* assemblage appears to be largely intact. The debris that covers this room consists of proportionately enormous amounts of ash, including a layer of dark gray to black ash 5–10 cm thick on or near the cobbled floor, which is likely the remains of the ceiling/roof. Many artifacts were found in

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14. Kathryn Kamp, based on her ethnographic research in Syria, also has noted the relative commonness of new construction and remodeling, because households easily and readily adapt and respond to changing functional needs requiring this kind of change. Both of these are described by her as frequent activities (Kamp 2000: 84).

the burned ash and debris, and a pattern is immediately noticeable. Virtually all of the *de facto* refuse excavated from Room 2 was confined to the north area of the room. For this reason, Room 2 is divided into two spatially segregated areas: (1) Area B, consisting of a little less than half of the northern area of the room, and (2) Area C, including the remaining space to the south (fig. 7).

Area B measures approximately 2.4 m × 2.75 m and was accessed through a doorway leading to Room 5 or from Area C. This area contains a considerable number and variety of artifacts. Ceramic vessels were smashed thoroughly and spread across the floor in this area. They include three storage jars, one pithos, three jugs, two cooking pots, one handleless krater, four straight-sided bowls, two juglets, and one red slipped, fenestrated stand that appears to have been broken, repaired, and reused.

Other artifacts include a bone disk, bone weaving spatula, bovine horn core, two small polished stones, two pieces of pumice, two grinding stone fragments, and some glass slag. Two finely dressed "standing stones" (*massevot* or *mizbeah*?), the head of a pillar figurine, one flat triangular-shaped stone, a polished rectangular stone, possibly a whetstone, one broken ceramic spindle whorl, two ballistas, and an iron arrowhead also were found on the floor of this area. Another iron arrowhead and a ballista were found in Area B, but these were located above the floor in covering destruction debris. Animal bones included, in addition to the bovine horn core, the remains of cow (lower molar, calcaneus, and a calf astragalus) and sheep (pelvis fragment and an astragalus). Three microartifact samples were taken from the floor in areas falling inside Area B (fig. 5). Only two tested positive for microartifacts, yielding grape pips (dominating one sample), cereals, legumes, and fish bones and scales.

Area C measures approximately 2.4 m × 4.0 m and was accessed through Area B. The nature of the material in this area—or, more accurately, lack of material—is markedly different from Area B. While the accumulation of destruction debris is similar to Area B in most places, a dramatic decrease in the number of artifacts, both large and micro, was observed. The only observed artifact included a small grinding-stone fragment. Microartifacts were similarly rare. Of four samples taken, only one contained microartifacts, yielding beach rock mortar fragments (see fig. 5).

Identifying activities that took place in, and determining the function of, Room 2 is a bit more complicated than it is for Room 1. The quantity and variety of artifacts in Area B of the room is greater than in any other area of the dwelling. Conversely, the south half of the room (Area C) is virtually barren of *de facto* artifacts, more so than any area in the dwelling. Combined, these two factors are telling with regard to room function. The ceramic vessels in Area B are numerous, with 8 to 10 out of 15 fitting well in functional classes associated with food serving and consumption. Based on the microartifacts, Rosen suggested that food preparation, but not cooking, took place in this room (Rosen 1992, 1993). Additionally, the grouping of these ceramics with three storage jars, pithos, fenestrated stand, and a multitude of greatly varied artifacts may suggest that artifacts were stored in this area, possibly for use in this room. Their presence in one of the only rooms with broad spaces unoccupied by permanent features and other remains is significant if food consumption and cultic activity took place in this room. Many of the artifacts (e.g., a piece of pumice, a bone "disk," a pillar figurine, and several shaped stones), in addition to the majority of ceramics, are good indicators of activities taking place in "living rooms," or areas where food consumption, domestic ritual activity, entertaining guests, socializing,

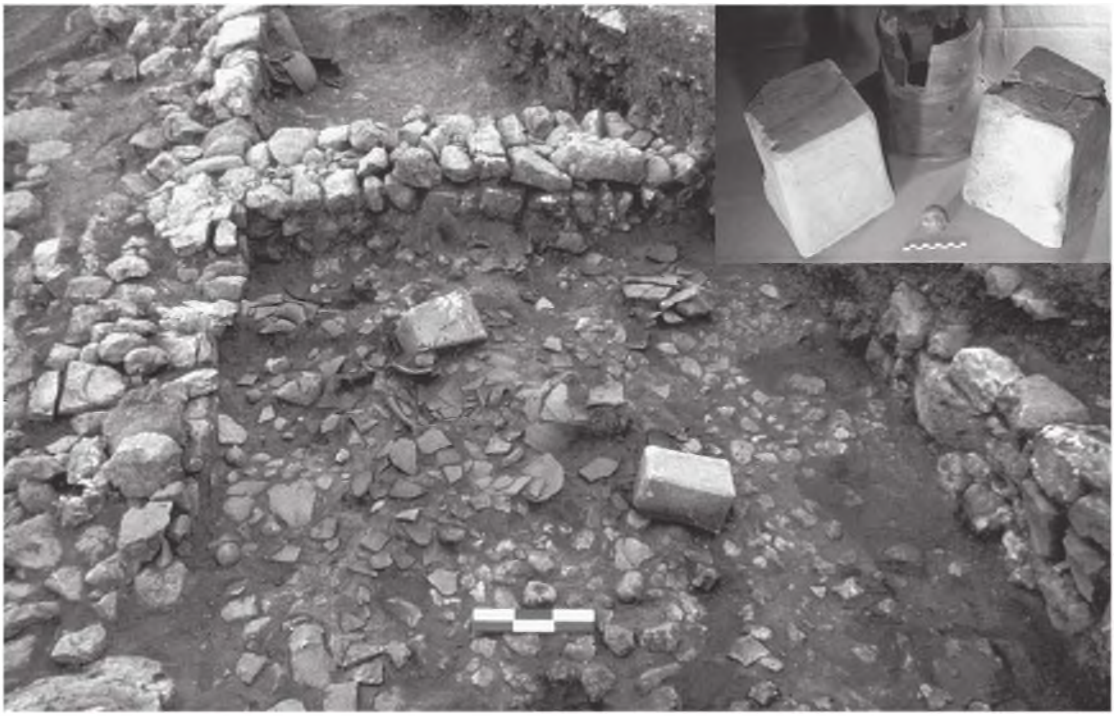

Fig. 9. Artifacts in Area B of Room 2 (looking north). Cultic items, including the two standing stones, fenestrated stand, and pillar figurine head (see insert as well) are seen mixed among the other artifacts on the floor.

grooming/adorning, and sleeping occurred. Additionally, the careful preparation of the floor in this room is consistent with floors from living rooms observed ethnographically in Southwest Asia (Kramer 1982a; Watson 1979). There is ample space in Area C for these types of activities to have taken place, and no other excavated room better meets these needs.

A number of activities can be inferred from the artifacts and their spatial organization in Room 2. Based on the presence of straight-sided bowls and jugs, as well as a number of other bowls, activities associated with food consumption and some food preparation probably occurred in this room. Ample space was available for a number of individuals to partake in food consumption together. Ethnographic examples show that large bowls or krater-type bowls are consistently found among societies whose people consume their meals together (Henrickson and McDonald 1983).

Cultic activity apparently also occurred in Room 2. The polished triangular-shaped stone, the two finely dressed and beveled standing stones, the broken pillar figurine, and the fenestrated stand are suggestive of such activity if these items were used, and not just stored, in Room 2 (fig. 9). A large, handleless krater could possibly have served as a basin, and two additional vessels may have been used in ritual activity as well—one cooking pot/bowl and one small juglet or vase. The fenestrated stand and the cooking pot were found lying next to one another in the debris on the floor and possibly functioned together in ritual activity. A cooking pot found less than a meter to the north of the stand may also have been used. The interior surface of the cooking pot/bowl was covered with a thick, dark, charred substance (also found on the large krater mentioned above). The substance was too badly carbonized to be identified by residue analysis. Carbonization could have occurred during the conflagration that destroyed the F7 Dwelling or when a substance was burned in the vessel.

A well-shaped and levigated vase-juglet reminiscent of an upside-down pomegranate also was found near this assemblage. A small black juglet commonly associated with the storage of oils, perfumes, or other unguents was recovered in the same vicinity. The shaped and polished rubbing/grinding-stones from this area are similar to stones found at other sites in contexts interpreted as cultic in nature (e.g., Locus 2081 and Room 332/321 at Megiddo [Loud 1948: 45–46] and Room 3283 at Hazor [Yadin et al. 1961: pl. ccvi]).[15]

The function of a number of other artifacts is even less certain. Among these are the horn core, metal objects (arrowhead), grinding stones, storage jars and the pithos, pitchers, sheep and calf astragali, the microartifacts, and others. Similar artifacts have been identified in cultic rooms and corners at other sites. Although these other sites may not possess identical artifacts, their classes are similar. These sites include the Stratum III Cult room at Ein Gev (Mazar et al. 1964: 23–29), Room 49 from Stratum V at Lachish (Y. Aharoni 1975: 26–32), Loud's Stratum V Locus 2081 at Megiddo (Loud 1948: fig. 101), House 440 Stratum VIIb at Tell el-Farah North (Chambon 1984: 136–39), and Room 3283 Stratum XI at Hazor (Yadin et al. 1961: pls. cciii–ccvi, xxxviii; Ben-Tor 1989).

The movement of items back and forth between sacred and profane contexts or their use exclusively in one realm or the other is hard to determine, but it seems certain that a number of the artifacts found in Area B were used in ritual activities. In addition to the ritual activity carried out in Room 2, a number of other activities are suggested by the artifacts and their patterning. Many of the artifacts in Area B can be associated with activities normally carried out in "living rooms" where inhabitants, and possibly their guests, would have shared meals. Ceramics used in eating, drinking, serving, and preparation were present. Several storage jars in this room may have held goods intended for consumption in this area. There was ample space in Area C for consuming food, entertaining guests, sharing of information, and otherwise acculturating members of the household. Food remains found in the room include those from grapes, legumes, cereals, fish, cow, and sheep. Lack of microartifacts from the finely prepared floors of Area C suggests that it was covered, possibly by textiles produced in the dwelling (discussed later this chapter) or by skins, mats, or other softer materials laid down for comfort. The same area provides ample space for sleeping as well.

Room 3

Room 3 is the southernmost of the three long rooms in the F7 Dwelling (fig. 4). It is separated from the other two long rooms (Rooms 4 and 5) by a solid wall. This room measures 2.5 m wide and at least 6.75 m long. The easternmost extent of the room disappears into the unexcavated balk, but excavation in areas to the northeast eliminate the possibility of its extension farther east. Access to Room 3 was gained through an entryway from Room 4, where the remains of a raised threshold are preserved. The remainder of the wall was not preserved past this point due to scavenging by later inhabitants (fig. 6). This also is the case for the entire southern wall of the room (Locus H7015). This wall was completely robbed out except for a re-used pillar protruding into the wall line from earlier strata (fig. 8). However, easily identified robber trenches suggest that both long walls of Room 3 were solid. It is possible that a doorway was placed in the eastern wall, allowing access into the dwelling from the outside, but this could not be determined since this area was not excavated. In light of poor wall preservation, the packed-earth floor of Room 3 (Locus H7005) is surprisingly well preserved, sealed under an accumulation of destruction debris 25–45 cm deep. Included in the fill was a layer of black ash 5–10 cm thick, immediately covering the floor—likely the remains of the roof. From this layer, several pieces of charred wood (thatching materials?) probably should also be associated with the roof. Covering this were numerous mud bricks—whole, fragmented, and in the form of detritus. Evidence of burning in this room is significant, because substantial accumulations of gray and black ash were found in pockets throughout the floor and the covering destruction debris. Pottery sherds lying on the floor showed signs of intense heat, including refiring and "bending," becoming misshapen. A number of installations/features were discovered, and one of these divides the room. A line of small stone cobbles (10–20 cm), one of which is perforated, runs perpendicular to the two robbed-out long walls just east of the center of the room (Locus H7012, fig. 8). If this was a partition or curtain wall, it was extremely flimsy and poorly preserved. The feature nonetheless effectively divides the room into two areas, which are treated separately below. The area west of this feature will be referred to as Area D and the area east of the feature as Area E (fig. 7).

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[15] For a more thorough discussion of the "cultic area" and its artifacts in the F7 Dwelling, see Hardin 2010.

While Area D furnished no restorable ceramic vessels, a number of other artifacts were recovered, including a total of 7 loom weights, 5 lying directly on the floor and 2 immediately above it in the destruction debris. All of these were found in the eastern part of Area D within a meter of the stone feature halving the room. In addition to the loom weights, a grooved basalt "maul" or weight, pitted stone, two perforated stones (one from the line of stones dividing the room), a stone bead, and one fragment of iron were recovered from the floors in this area. Artifacts found above the floors in the covering destruction debris include an iron arrowhead, hammer/grinding-stone, and a square chalk object with two holes, possibly a button or "buzzer." Only one microartifact sample was collected in this area, and it tested negative for microartifacts.

Excavation in Area E of Room 3 revealed numerous features and artifactual remains on the floor. Adjacent to the stone feature that divided Areas D and E is a small semicircular installation made of fieldstones that abuts the southern wall of Room 3. Approximately 50 cm to the east of this installation, a stone-lined bin was dug into the floor (fig. 8). A number of ceramic vessels were recovered in the vicinity of these features, including three storage jars and two jugs. Another storage jar was found in the fill above the floor, preserved in a very fragmentary state. Artifacts found lying on the floor included a mother of pearl fragment, two small disc-shaped wadi pebbles, a ceramic stopper/disc, and eight stone objects associated either with grinding (five examples) or pounding (three examples), or perhaps both. Artifacts found in the destruction debris covering the floors included an arrowhead, scale-weight, ceramic stopper, ballista, grinding-stone, seashell bead, and spindle whorl. Two microartifact samples taken in Area E both revealed fragments of metal slag and red ochre.

The use of Room 3 varies between Areas D and E. The negative microartifact sample collected and sparse *de facto* refuse in Area D complicate a clear understanding of the room. Additionally, formation processes alone cannot be used to explain the scarcity of artifactual remains. Even though the north and south walls were mined by later occupants, these efforts do not appear to have caused severe disturbances to the artifacts in Area D. While no ceramics were found on the floor, other artifacts were recovered. As mentioned previously, they included a group of five loom-weights resting on the floor and two additional weights in the destruction debris, all in the eastern half of Area D. The proximity of these weights to a perforated stone and the line of stones halving the room, one of which also is perforated, suggests weaving activities and the likely presence of a loom. One of the perforated stones may have held the base of a vertical pole supporting an upright loom from which the loom weights were suspended before they were baked in the conflagration and deposited on the floor when the other components were consumed in the fire. Or, it and the other perforated stone may also have been suspended as weights to keep taught the lengthwise warp threads. The bin next to the line of stones possibly served as a repository for the loom weights when they were not in use, but it may have been unrelated to weaving activities altogether.

In addition to weaving, a number of other activities may have taken place in Area E. Features and artifacts buried in the *de facto* refuse there are varied. The ceramics included four jars and two jugs—forms that can be associated with liquid storage and serving. No bowls or cooking pots were found in this area. The number of stone objects found in the north half of Area E is significant and suggests activities associated with grinding and/or pounding. Perhaps this may explain the red ochre in the microartifact samples. Seed remains were also collected in the center of Area E, but these are not directly associated with the lithic objects. The other artifacts were generally located near the center of the room but are highly varied. A spindle whorl adds more evidence of textile working, and red ochre found in the collected microartifact samples may have been used as a pigment. Two items of personal adornment (beads) in the area are consistent with ethnographic data that suggest women performed most activities associated with textile production at the household level in Southwest Asia (Friend 1997). It should also be noted that Tell Halif has produced more artifacts associated with weaving, especially loom-weights and spindle whorls, than most other Iron II sites in the southern Levant in spite of the limited scope of excavation of Iron II deposits. Friend (1997) has proposed that there was an active cottage industry at the site, since most of the evidence for weaving comes from domestic contexts.

While there is strong evidence for textile production, including spinning and weaving, some of the other artifactual remains are more ambiguous with regard to activities carried out in Area E. The numerous fragmentary grinding-stones along with cereals and possibly the installations set into the floor are suggestive of food processing, but no microartifacts yielded evidence of this activity in either Area E or D. The two jugs suggest liquid serving and consumption, and the jars suggest some storage. But no specific activities could be associated with the single scale-weight, the green slag, and the red ochre. It is possible that Room 3 served as a second living room, perhaps serving a second nuclear family or members of the same nuclear family occupying Room 2 (Kramer 1979). Or, it is possible that Room 3 served as a multi-activity area but especially for women involved in textile production.

Room 4

Room 4 is the central long room of the dwelling. It measures 2.75 m wide and no more than 6.75 m long (fig. 6). Preservation in the eastern excavation units is poor due to later disturbances, but the few remains that are preserved suggest a length for the central long room no greater than 6.75 m. The room could be accessed from a doorway leading to/from Room 3 or by simply walking between the pillars from Room 5 into Room 4. An additional doorway probably existed in the east wall, allowing access to the dwelling from the outside, but this could not be determined definitively due to disturbances of the east wall of the room.

Floor treatment in Room 4 consisted of both flagstone pavers and packed earth. The western half of the floor treatment consisted of slightly undulating packed earth on which rested a number of installations. An area of the earthen surface near the doorway leading into Room 3 is heavily disturbed by an intrusive Persian-period pit (Locus G7006) cutting through the Stratum VIB layers and removing the end of a north/south wall. The east area of the Room 4 floor is treated with large flagstones. In the discussion that follows, the room is divided into three areas based on the differing floor types and the spatial segregation of artifacts and other permanent features associated with these floors. These areas are designated as F, G, and H (fig. 7).

Area F, measuring 1.5–2 square m, is located in the southwest corner of Room 4 between Installation G7022 and the doorway leading to Room 3 (fig. 8). A small installation of two or three stacked fieldstones was placed 20 to 30 cm from the southwest corner of the room and was found supporting an intact storage jar lying on its side. Two additional storage jars were found in this area, along with a loomweight, stone bead, perforated piece of shell (adornment?), and the bird-like head of a figurine with traces of white slip and red paint. No microartifact samples were collected in this area.

Area H lies immediately north of Area F and consists of the space surrounding a large circular platform or installation (Locus G7022) laid against Room 4's western wall. It was built of small cobbles laid on the floor and measures approximately 1.75 m in diameter (fig. 8). It was covered in gray and black ash, but no determination could be made regarding whether this ash was to be associated with the destruction debris or with activities associated with the use of fire. The former association is strongest, since no charcoal or seeds were detected on the platform nor were high correlation coefficients of wood and bone observed in the microartifacts (Rosen 1992). Artifacts associated with the installation in Area H are sparse and include only two ceramic vessels: a bowl and a krater. A large storage jar was found lying immediately to the south between this area and Area F and likely is associated with the latter area. The only microartifact sample collected yielded remains of cereals, fish bone, and eggshells of small birds.

The final area of Room 4, Area G, is located east of Areas F and H and of the robbed-out wall disturbed by the intrusive pit Locus G7006 (fig. 8). It consists of the flagstone floor observed between the pillar (Locus G7020) and the robber trench

(Locus H7011; see fig. 7). This includes an area of floor approximately 2.5 m square, constructed of large cobbles and flagstones. It was covered with accumulations of destruction debris to a depth of 50–75 cm and contained few artifacts. Ceramics preserved on the floor included a baggy-shaped hole-mouth pithos and a bowl. No other artifacts were found on the flagstone floor; however, microartifacts consisted of cereals and fish bone (Rosen 1992).

Room 4 contained some of the more heavily disturbed areas of the F7 Dwelling, because a large pit (Locus G7006) cuts through its remains, removing *de facto* refuse from the center of the room. In addition, the scavenging activity associated with the mining of the room's south wall removed stones from the south portion of the flagstone floor (Locus G7016) and disturbed *de facto* refuse near the wall.

The central long room contains a number of features and artifacts that are revealing concerning the activities performed there. Two installations that flank the room to the west are well preserved. The installation in Area F is associated with two or three storage jars. One was found intact on the stacked fieldstones, demonstrating the installation's use as a stand, holding the jar approximately 35 cm above the floor. It may be significant that the jar was found lying on its side on this platform. This position may have served to keep a stopper moist, or it may have allowed easier access to the vessel's contents. This phenomenon is addressed in more detail under the discussion of Room 5.

The platform in Area H was found covered in ash. It had a krater and a bowl placed on its surface, and microartifacts collected there suggest food preparation. This feature likely served either as the base for a large storage bin or, more likely, as a platform for food preparation. Its placement near other cooking areas located in Room 5 lends support to the latter interpretation. Ethnographic data from Aliabad describe similar platforms used for a variety of purposes in courtyards near cooking areas (Kramer 1982a, 1982b).

Moving to the east, one encounters the intrusive pit and then Area G, the area consisting of the east portion of Room 4 paved with flagstones. Although some stones are missing, most appear to be intact. Stager (1985) makes a compelling argument for the association of similar areas observed in other pillared dwellings with domestic stables. It is tempting to identify this area accordingly for several reasons. The flagstone area of Room 4 is spatially segregated from the areas interpreted as "living areas" (fig. 7). Animal waste is easily removed from the surface and urine is allowed to percolate through the cracks. Additionally, the surface treatment is consistent with ethnographically described stables in 19th- and 20th-century Palestinian dwellings (Hirschfeld 1995: passim). Cereals in the microartifacts do not preclude this understanding, and it is possible that the baggy pithos was used for feeding stabled animals. It would be interesting to know if the cereals found in the microartifacts are barley, which more often is associated with animal fodder than with victuals (see Kramer 1982a).

The remains in Room 4 best fit a multifunctional interpretation for the various areas of the room. The west areas (F and H) are suggestive of food preparation and some storage, and the east areas would function well as a domestic stable, possibly housing equids or other animals, including sheep, goats, horses, asses, or cattle.

Room 5

Room 5 is the third and final long room of the dwelling. It measures 3.25 m wide and no more than 6.75 m long. The long walls of Room 5 consist of a solid stone and mud-brick north wall and a south pillared "wall" composed of at least two, and possibly three, limestone pillars (Locus G7019 and Locus G7020 with a third pillar possibly in the balk [fig. 8]). The pillars divide Rooms 4 and 5. The north wall (Locus F7003) is made of well preserved mud bricks laid on a stone foundation. It is preserved to a height of 1.2 m and consists of individual bricks, which could still be identified, laid in a single row 54 cm wide. A doorway preserved in this west wall allowed the only observable access to Room 1. As mentioned previously, this doorway is partially obstructed by an installation, leaving only 60 cm of unobstructed passageway. Room 5 could also be entered and exited from Room 2 or by simply walking between the pillars separating Rooms 4 and 5.

The floor of Room 5 consisted predominantly of leveled, hard-packed earth. However, a narrow area along the north wall was prepared with small cobbles (Locus F7019; fig. 8). These floors were covered with destruction debris preserved over a meter in depth. It consisted of burned mud bricks and detritus, charred wooden beams, and pockets of gray, brown, and black ash. Accumulations along the north wall were more than 1.25 m deep, preserving numerous artifacts, installations, and features. The only place where this was not the case was near the center of the room where an intrusive stone-lined pit (Locus G7007) from the Persian Period was dug into Iron II deposits by later occupants of the site. The floor space of Room 5 is divided into smaller areas surrounding the permanent architectural features and installations found on the floor of the room (Areas I–M [fig. 7]).

Area J includes an area in and surrounding the installation that partially blocks the doorway between Rooms 1 and 5 (Locus F7008 [fig. 8]). This semicircular installation is laid against the west wall and measures approximately 1.2 m long and 1.3 m wide. It is built of one or two rows of small cobbles (5–20 cm in size) stacked atop one another to a height of three courses and covered with a mud plaster. Two ceramic vessels were found in the vicinity of the installation, including an amphoriskos and piriform juglet too fragmentary to restore. On the floor near the installation, excavators also found a ground, round stone, pitted stone, bone disk, bulla, and body fragment of a white-slipped pillar figurine. Two scale-weights, a scaraboid/bead, stamp, bone disk, piece of hematite, ballista, knife/sickle blade, iron arrowhead, bulla, and two pottery "stoppers" were found in the fill above the floor and in its vicinity. No microartifacts samples were collected in the interior of the installation.

Area I includes a space measuring 30–50 cm against the northwest face of the west pillar of Room 5. A small semicircular installation made of stones and finished with mud was placed against the north side of the pillar. Its east extension was interrupted by the intrusive Persian-Period pit mentioned previously. Many carbonized remains were recovered from its interior, and black ash was apparent around the feature. Its use as a hearth or oven seems certain. Remains recovered in its immediate vicinity include a number of ceramic vessels: two storage jars and cooking pots, a krater, three bowls, a juglet, and lamp. Other artifacts found on the floor near the installation included a pierced stone, loom-weight, and a piece of metal. Four microartifact samples were collected near Area I (fig. 5), and all yielded greenish slag. Artifacts found in the debris covering the floor included a small bone disc, ground round stone, and a bead.

Area K includes a small area 75 cm in diameter immediately surrounding a limestone mortar sunken into the floor 50 cm east of Area J (fig. 7). Resting on the floor to the north and east of the mortar were three large pithoi. Additional artifacts on the floor included a loom-weight and pierced shell. Other artifacts not lying on the floor but in the same vicinity included a grinding-stone and iron arrowhead. No microartifacts samples were collected in this area.

Area M includes a large quantity of artifacts found preserved along the northern wall of Room 5. Most of these artifacts seem to be related to the cobble-prepared surface (Locus F7019) located along a portion of this wall (fig. 7). Area M surrounds the smaller Area L, which includes limited space around a tabun preserved intact on the floor. However, no patterns or spatial separations of artifacts belonging to either area were immediately recognizable. Area M's proximity to the north wall, which was preserved to a height of 1 m, helped protect artifacts located in this area from later disturbance. The vessels lying farther away from the north wall and closer to the intrusive pit/bin (Locus G7007) were less well preserved. This disturbance caused noticeable depletions in the *de facto* refuse in these areas. However, ceramics and artifacts that were recovered were numerous. Ceramics included 12 storage jars, 3 jugs, 4 bowls, 2 lamps, and a small cooking pot, funnel, and strainer. The objects collected from the floor were centrally dispersed in Area M and include 10 loom-weights, 4 hammer stones/ballistas, 2 stoppers, and a bone tool, iron "nail," and iron arrowhead. Four microartifact samples were taken, but only one yielded positive results (fig. 5). The westernmost sample was taken from floor buildup on top of the cobbles and yielded homogenous brown flint chips. The two samples taken nearest the tabun were negative for microartifacts. Artifacts found in the fill above floors in Area M were numerous in the easternmost and westernmost sections of this area. In the west third of Area M, 8 loom-weights, a ballista, piece of hematite, and a worked bone were recovered. In an area about a meter to the east of this first aggregation, an iron arrowhead and two loom weights were collected from above the mud brick of the north wall, and a single stopper was found near the floor.

The numerous features and quantity of artifacts from Room 5 make it one of the more interesting areas studied. The features at the west end of the room are consistent with food preparation and function, together with areas in the west area of Room 4. These remains are consistent with a "kitchen" or food preparation and/or processing area. Area I served as the cooking oven, an interpretation supported by the charred remains inside the installation laid against a pillar and the number of ceramic vessels whose use is consistent with food-preparation activities. Further corroboration includes microartifacts recovered from an overlapping area between Areas I and J that produced cereal remains, eggshells, and fish bone. The presence of heavy ash deposits is also consistent with cooking areas. The four microartifact samples recovered from north of the installation all yielded greenish slag, suggesting the additional activity of metalworking at the hearth. A small piece of metal and a small, very thick-walled juglet also suggest metal-working activity in this area.

Most of the finds related to the installation in Area J were provided from within the covering fill and debris in its vicinity. The ashy debris filling its interior possibly preserved the remains of fuel such as dung cakes, branches, or other combustibles used in nearby installations in Areas I and L. It also resembles "catch basins" of the type used for grinding activities associated with large querns. The size and the building technique of the feature resemble examples known from Tell Halif's Field III, Tel Rehov (Fries 2006), and many other sites, and its proximity to Area K is, I believe, salient. Missing, however, is the presence of a saddle quern. But, as stated above, many of the artifacts found in this area are not from the floors and are not consistent with grinding activities. Many of these are more consistent with the *de facto* refuse from Area M and are thus better associated with those remains.

Area K provides excellent evidence for the processing of cereals. A large limestone mortar (Locus F7020) was found sunken into the floor and was flanked to its north by three hole-mouth pithoi. Similar pithoi with flat bases, wide orifices, and out-turned rims that allow a cover to be tied across the mouth have been linked ethnographically to the storage of dry goods such as cereals (Henrickson and McDonald 1983). A grinder found in this vicinity may have been used here or in Area J. Area L provided a small tabun just to the east of Areas I, J, and K. A number of vessels associated with food preparation were found in its environs, but these could not be spatially segregated from vessels in Area M. Some vessels are consistent with food preparation, including a small cooking-pot and a large bowl. However, these vessels were possibly used in activities associated with Area M. In Area M, the ceramic assemblage is dominated by storage jars, 12 in total. These apparently were stacked one on top of another along the cobbled portion of the floor (Locus F7019). Mixed among the storage jars were other ceramics and various artifacts. The microartifacts from this area provided limited evidence of localized flint-knapping. However, based on the quantity and homogeneity of the debitage, this activity was limited to a few isolated occurrences (Rosen 1993). Additionally, none of the other three samples produced microartifacts.

When considering the large number of storage jars, it is possible that the assemblage in Area M is indicative of storage, which perhaps was done as surplus in anticipation of siege. However, another possibility is suggested when the assemblage of artifacts and ceramics is taken as a whole. The large quantity of storage jars, the several stoppers, and the presence of a strainer and funnel are suggestive of activities associated with the processing of some type(s) of liquid. The bells on both the strainer and the funnel are much larger than known examples associated with the service of beer and wine. Wear traces could be observed on the exterior surface of the strainer and funnel that are consistent with their insertion into the mouths of the storage vessels.

To help determine how the ceramic assemblage of Area M functioned as a whole, residue analysis was performed on selected vessels by Patrick McGovern of the Museum of Applied Science Center for Archaeology. Three storage jars were tested, along with the strainer and the funnel. All five vessels tested positive for tartaric acid, a substance that, in nature, is almost exclusive to grapes.[16] Due to the residue analysis results, the large number of storage vessels, the presence of stoppers, and the size of the bells on both the strainer and the funnel, I suggest that activities taking place in Area M be associated with wine-production processes instead of surplus storage associated with siege preparation activities.

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[16] For the technique, see Badler et al. 1990; Formenti and Duthel 1996: 83–84; McGovern and Michel 1996.

This reconstruction of the activities in Area M explains the presence of many of the artifacts and is consistent with what is known regarding the production of wine during this period. The scale of the operation and presence of two bullae suggest that the activity was undertaken at a level beyond domestic or personal consumption. That spatial location of jars may be related to function or content has been observed ethnographically in the southern Levant. In his early ethnographic observations, Dalman (1935: 251–52) notes that the storage of wine, oil, and possibly beer is usually located in a dark interior room or cellar. Burned beams lying directly on the floor of Area M as well as the occurrence of two lamps in its vicinity provide evidence that this space was roofed. It is reasonable that a temperature level conducive to fermentation of the must in the jars would have been maintained in this room. The roofing, or spanning, of this space raises an issue about the remainder of the space in Rooms 4 and 5.

Roofing

It already has been proposed that Rooms 1, 2, and 3 were completely roofed. A number of scholars believe that one of the pillared long rooms usually was left open to serve as a courtyard (Fritz and Kempinski 1983: 27; Herzog 1984: 77; Shiloh 1970, 1973; G. E. Wright 1965: 61, 1978: 153; G. R. H. Wright 1985: 74). Many of the activities occurring in Rooms 4 and 5 are consistent with those occurring in courtyards. However, does this mean that areas outside of Area M were left uncovered? The data here suggest not. The two pillars separating Rooms 4 and 5 almost certainly served as structural supports for roofing material. Their presence therefore suggests that at least half of this space—Room 4 or Room 5—was spanned by a roof (fig. 10). Roof material in Area M suggests that Room 5 was covered and, similarly, roof material and the occurrence of lamps in Areas H and I intimate that the west half of Room 4 was covered. Additionally, ethnographic data demonstrates that stabling areas almost always are covered (Hirschfeld 1995; Holladay 1986, 1992a, 1992b, 1997). If the interpretation of this area is correct, I suggest that the majority of space in Rooms 4 and 5 was roofed. However, it also is possible that a small area was left unroofed to allow light to enter and smoke to escape. It is quite likely, therefore, that a small area between two of the pillars, or between a pillar and a wall, was left open to serve as a skylight and exhaust vent. Overall, it is likely that most of the floor area of the F7 Dwelling was roofed and quite possibly carried a second floor.

Conclusions Regarding the Use of Space in the F7 Dwelling

At Tell Halif, valuable insight was gained concerning the organization of space within the F7 Dwelling. Its inhabitants likely were viticulturalists/agriculturalists living in a small fortified site on the southwestern border of Judah. In addition to winemaking, its members performed a full set of domestic activities in the confines of the dwelling as well as additional activities associated with ritual and the production of textiles. They stored goods, cooked and otherwise prepared food, and served and

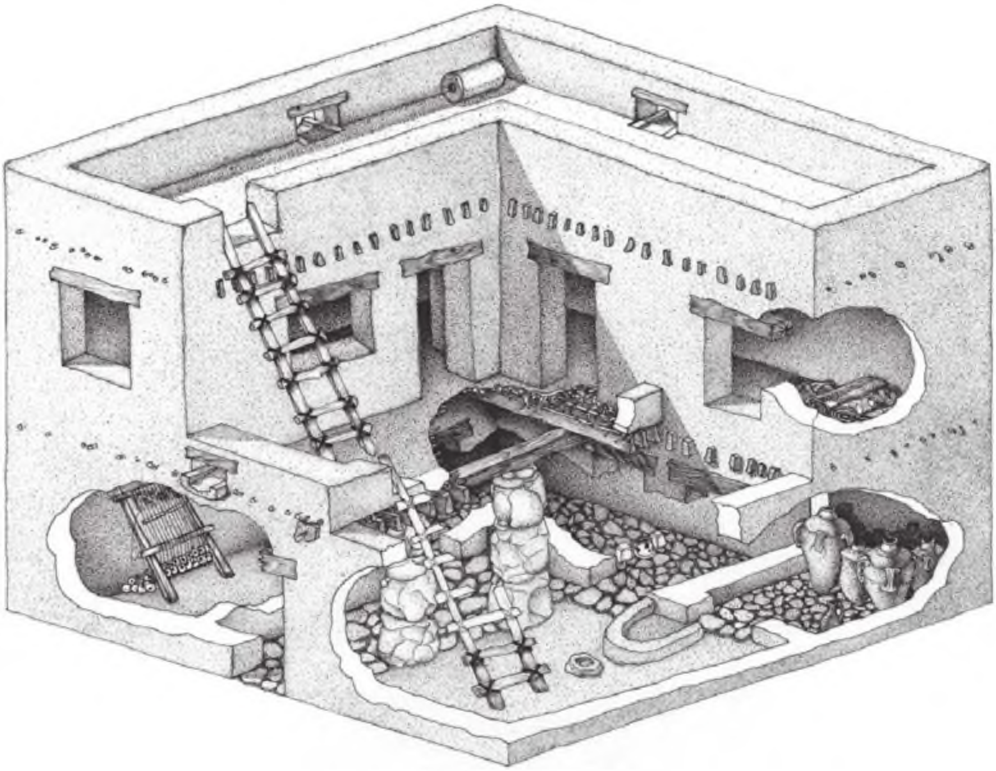

Fig. 10. One possible reconstruction of the F7 Dwelling by Dylan Karges.

ate meals. Large krater-type bowls suggest that meals were shared as a social activity among the occupants of the dwelling. They dined on food produced locally as well as food imported from the Mediterranean coastal regions. The occupants carried out ritual activities, stabled animals, made wine, and produced textiles at the domestic level or perhaps as a cottage industry. The occupants also likely entertained guests, socialized children, and slept in the dwelling.

Based on the activities carried out in the F7 Dwelling, its occupants were mostly self-sufficient: they produced wine and textiles and perhaps some or all of the other agricultural goods for which there is archaeological evidence in the dwelling. The only direct evidence for agricultural activity in the F7 Dwelling beyond viticulture is the occurrence of two metal sickle/knife blades and evidence of several episodes of flint blade retouch in two different areas of the dwelling (blades for perhaps harvesting wheat or pruning a vineyard). Three plowshares were found in houses in the immediate vicinity of the Dwelling, connecting them to active participation in agricultural activity.

It is tempting to associate the locus of the agricultural activities of the F7 Dwelling's occupants and other houses in its vicinity with the land-tenure system of ancient Israel and Judah described in the biblical text (e.g., Judg 21:24; Num 36:6–9; 1 Kgs 21:1–3; Isa 5:8; Mic 2:2). The land system described in these texts is one in which land ownership is spread as widely as possible among the extended families of ancient Israel and Judah (biblical *betei-ʾav*), always staying within its original clan (biblical *mishpahah*). Within this system, each extended family possessed a land plot or *nahalah* that could never be sold permanently and was intended to provide the economic livelihood of each extended household in ancient Israel's and Judah's agrarian economy (Malamat 1962; Wright 1992). There is no direct way, however, to associate the F7 Dwelling with the biblical land-tenure system or even to know if this system was common or even practiced in the 8th century B.C.E. (however, see Wright 1992).

Although the occupants of the F7Dwelling were self-sufficient in many ways, a number of its finds and reconstructed activities demonstrate the occupants' integration into a regional economy at several different levels. The amazing similarity of its ceramic assemblage to assemblages at other Iron II sites in southern Judah suggests that integration into a regional production and distribution system extended at least through the southern regions of Judah. The two bullae suggest economic activity beyond the household. Because one of the bullae contains a "flying scroll," sometimes connect with the crown, it is likely that they represent integration into the Judahite political system at some level. Perhaps the most important indicator of regional integration are the fish remains so common in the F7 Dwelling and every other house excavated in Field IV. Because these fish can only come from the Nile of Egypt or the Mediterranean Sea, they represent an economy integrated, not only with Judah, but also regionally, because the fish would have had to pass through Philistia. The occupants of the F7 Dwelling could have exchanged wine and possibly textiles to bring in outside goods within this integrated system. However, at present it is not known how direct this exchange was.

With regard to the occupants, several scholars suggest that individual three- and four- room houses were occupied by nuclear families clustered together into extended family compounds or quarters (Faust 2002; King and Stager 2001; Shiloh 1970, 1978, 1987; Stager 1985). However, I see no reason to assume that two or three generational families could not have occupied at least the larger versions of these houses similar to the F7 Dwelling. Shiloh suggested that the small size of the dwelling was evidence of their use by a nuclear family. However, if a covered second floor is added to the typical four-room houses, it brings the total roofed space to between 70 and 200 square m. This is adequate space for an extended household and a full range of domestic activities. David Schloen's recent research (2001) on the "House of the Father" supports this interpretation. The evidence at this point remains equivocal and invites further investigation. Interestingly enough, the best locus for studying different types of household organization (nuclear vs. extended) is the one unchanging entity throughout the entire Iron Age—the four-room house.

Because the pillared dwelling is essentially the same throughout the Iron Age, the best place to look for clues for household organization is in the material artifacts and their distribution in these houses. The four-room house can be viewed in the realms of both fact and symbol (following Schloen 2001). It was functional—a fact—and met the needs of its inhabitants, who utilized diverse subsistence strategies as a means of spreading risk to better insure their survival and prosperity. It was emblematically representative—a symbol—and communicated important cosmological and ideological views of its occupants until this typical house-type disappeared at the end of the Iron Age.

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Section 6

Afterword

About the Archaeological House: Themes and Directions

Roger Matthews

The papers in this volume represent an impressive collection of investigations into issues surrounding the house, home, and household in the ancient Near East and beyond. There is no doubt that this volume will stand as a state of the art (or should that be "state of the science"?) exposition of house and household archaeology that will be consulted and enjoyed for years to come. During the three days of papers and discussion at the University of Utah in February 2009, a multitude of relevant issues were aired and explored in a relaxed yet stimulating environment. The conference culminated in a closing discussion session, under my guidance, that followed a series of connected themes. In this concluding essay, I discuss the most pertinent of these themes and provide some general thoughts on avenues for future research in the archaeology of the house and household.

Definition and Transparency

There is a paramount need to be explicit and careful in defining relevant terms when engaging in, and reporting on, household archaeology. This concern is manifest throughout this volume by a welcome aim for precision, or at least clarity, in the articulation of terms, whether it be house, household, home, house society, neighborhood, compound, family, and so on. This articulation is a natural starting point for investigation and discussion, ensuring that we share a degree of comprehension. Perhaps the most significant features of the key terms, however, are their slipperiness and tendency to overlap and intersect with each other in contextually specific ways that may change through time and space. It is as if we cannot posit a full and fine definition of any of the relevant terms without situating them within the rich detailed specifics of each narrative from each site, even from each house, home, or household within each site, or each level/phase within each house. This slipperiness, and yet contextual specificity, is neatly encapsulated in Meredith Chesson's statement that, "homes encompass physical and social landscapes, buildings, peoples, hopes, disappointments, the future, past and present of people. It can be a town, a physical structure, a tent, a region, a riverbank, a forest, or a group of people." The search for rigid and absolute definitions of terminology within the archaeology of houses and households thus needs to occur within a discourse rooted in chrono-spatial coordinates of individual case studies, as indeed pursued throughout most of the papers presented in this volume.

In addition to the need for definition of terms within individual contextualized studies, there was general agreement in the discussion session that it should be made explicit by each author what their world-view was as regards their subject of study. The need to demonstrate critical self-awareness and transparency in writing about ancient households is to the fore, and this should include an articulation of what the expectations were in taking particular approaches to the archaeological record. Too often, archaeological narratives present themselves as inevitable stories of predictable pasts, logically recovered from a data source that is already largely understood. As authors, we tend to omit discussion of the approaches we never took or, more likely, of the approaches we did take but which did not yield what we wanted or expected them to. In Christine Hastorf's words, we need to be explicit about "what archaeologists are valuing" when we plan, conduct, and publish our field activity. These concerns manifest themselves in many of the papers in this volume.

The Context and Scope of Household Archaeology

Many of the authors here evince a conviction that the systematic study of small-scale material traces, often microscopically small (Weiner 2010), of human activity within and around buildings is of value in itself, informing us on the physical loci and precise nature of individual practices across time and space. Indeed, in the discussion session, Stuart Campbell championed household archaeology "as liberation from the Big Picture," whereby archaeologists of the household need not feel obliged to align their findings and interpretations with grand narratives of the human past but rather may revel in the individuality and contingency of human action at particular times and places.

Beyond this inherent value, there is a broad recognition of complex, yet approachable, relationships between what people do in the small spaces of their daily lives and the larger-scale forces at work on any given social entity, whether it is a family, household, neighborhood, community, or society at large. Outlines of the contours of these relationships are traced by many of the authors in this volume and epitomized in Bradley Parker's proposal that "households are not passive respondents. Instead, they are the loci of iterative actions where personal identities and economic, social and ideological interests of family groups intersect with and shape the trajectory of communities, conditioning community participation in broader social processes."

The value of studying the house and household is thus not solely in what we thereby learn about daily practice and everyday life, which in itself is considerable, but more significantly in deeper understandings of wider social trends and processes and of the interplay between individual and communal concerns in any given society or community. The nodal role of the house and household in this regard is beyond doubt: "It is important to recognize that throughout the vast majority of Near Eastern antiquity the private household remained the primary focus of economic activity. A concentration upon the temple and the palace distorts the social order of the greater Mesopotamian world" (Lamberg-Karlovsky 1999: 183).

The wider significance of the archaeology of households to social issues manifests itself in the alternative titles for this volume proposed, not all in seriousness, at the discussion session:

> "Archaeology of Everyday Life" (Lynn Rainville)
> "Archaeology of the Lived Experience" (Lynn Rainville)
> "Transparent Narratives on Household Archaeology" (Ruth Tringham)
> "Archaeology of Intimate Happenings" (Ruth Tringham)
> "House and Society" (David Frankel)

Apparent Uniformity in Approach

Most of the authors adopt a pragmatic, positivist stance to the archaeological record that can be summarized as contextual and integrative, certainly leading to significant and valuable interpretations. But some of the studies struggle to free themselves from a functionalist viewpoint that associates specific physical traces in a unilinear manner with specific activities, such as food preparation, storage, or waste disposal, with little consideration given to the possibility that similar sets of material traces might result from widely varying sets of past behaviors. Deeper and richer contextualized and interpretive approaches are the only solution and are indeed widely employed through several of the papers.

A related point is that many of the authors employ quantitative methods in characterizing assemblages of artifacts, macro and micro, from within and around structures. The development of the discipline of microarchaeology is a major feature and achievement of Near Eastern archaeology in recent years, pioneered in such studies as those by Lynn Rainville (2005) and Craig Cessford (2005). The specificity of the quantitative approach and its ability to generate comparative sets of statistical information can lure us, however, into a sense of over-confidence about the significance and value of our interpretations. On the one hand, by definition, quantitative methods focus on the measurables of the archaeological record, excluding the nonmeasurables. On the other hand, there can be a tendency to over-interpret quantitatively derived information, with insufficient attention given to the problem of "background noise" at the micro-level in archaeological deposits. Cessford (2005: 63) succinctly summarizes the basic problem in relation to heavy residue microarchaeology at Çatalhöyük:

> It appears that much of the material deposited at the site occurs as a form of 'background noise', indicative of residuality in a densely-occupied site where the raw material for creating most deposits was obtained from sources which already contained cultural material. There therefore appears to be only a low level of agency or intentionality associated with the deposition of at least some micro-artefacts. In essence there is a form of negative choice or deliberate unintentionality in that it is acceptable for most deposit types to contain most forms of material. This conclusion, whilst important in itself as it serves to challenge the implicit assumption in most previous work that micro-artefacts can be simplistically linked to *in situ* activities, is largely a negative one.

While accepting Cessford's cautionary note, it can be stressed that ongoing development of archaeological field techniques, including higher resolution microarchaeological approaches to distinguishing floors and on-floor deposits, pioneered through the work of Wendy Matthews and others, is steadily improving our ability to associate small-scale traces of human activity with specific episodes in the histories of individual rooms and buildings.

Using Our Imaginations

It is notable that the range of human activities encompassed within most of the studies in this volume is, not surprisingly, largely restricted to those activities that are known, or believed, to leave visible material traces and thus to be recoverable and measurable from within the archaeological record. Throughout the papers, terms such as food preparation, storage, grinding, processing, and cooking commonly occur, with much less attention awarded to activities such as sleeping, talking, singing, hosting, visiting, procreating, defecating, and so on. Although approaches to less-materialized sets of past human activities are beyond doubt difficult to conceptualize and even more so to operationalize into practical protocols, it is arguable that our reconstructed pictures of past household lives are incomplete as long as they fail to encompass the full range of past activity. There is scope still for the formulation and exploration of richer scenarios in human individual and social behavior that takes greater account of the fullness and flexibility in the ways that people behave alone and together.

For example, in the discussion session, Meredith Chesson related how she uses an artist to create reconstruction drawings of excavated levels of buildings and spaces, finding this practice highly valuable in aiding concrete thinking about how the past actually looked. How did people's faces look, how did they hold their children, how did men and women behave together in public and private spaces? These are not necessarily easy questions for an archaeologist to address, but in attempting an answer, or a series of alternative answers, the imagination is fully brought into play and there may be valuable feedback into field methodologies and research strategies.

Conclusion

I would like to conclude by delineating three potential directions for future research into the archaeology of the house and household in the Near East and beyond. First, while several of the authors make advantageous use of multiple strands of archaeological evidence—drawing on architecture, artifacts, archaeobotany, archaeozoology, and so on—to outline past sets of human behavior within and around the context of house and household, there is still room for more fully and deeply integrated approaches that incorporate evidence from within and beyond individual houses, buildings, neighborhoods, sites, and regions. These approaches will be multiscalar, nonlinear, multicomponent integrations of insights and interpretations from multiple viewpoints, incorporated within holistic worldviews that can be characterized as "deep ecology" (Devall and Sessions 1985), encapsulated thus by Fritjof Capra (1996: 7):

> Shallow ecology is anthropocentric, or human-centred. It views humans as above or outside of nature, as the source of all value, and ascribes only instrumental, or 'use', value to nature. Deep ecology does not separate humans—or anything

> else—from the natural environment. It does see the world not as a collection of isolated objects but as a network of phenomena that are fundamentally interconnected and interdependent. Deep ecology recognizes the intrinsic value of all living beings and views humans as just one particular strand in the web of life.

Deep ecological approaches will need to explore the life-histories not only of buildings and the human occupants of buildings (as argued so lucidly in this volume by Ruth Tringham, Wendy Matthews, and others) but also of the ecology of the animals and plants who share life-spaces with humans in and around buildings, settlements, and landscapes. Intimate understandings of the life-ways of relevant animals and plants will need to be interwoven into architectural and human narratives in approaches that concern themselves with specific integrative issues, such as rhythms of life, seasonality, change and stability, remembering and forgetting, killing and nurturing, cleanliness and disposal, and countless other potential research arenas. Such deep ecological approaches can be founded on the solid platforms already constructed in innovative, multicomponent research underway at the Neolithic sites of Çatalhöyük in Turkey (Hodder 2005), Sabi Abyad in Syria (Verhoeven 1999), and Tol-e Baši in Iran (Pollock et al. 2010).

Second, many of the authors in this volume draw, directly or otherwise, on the superb ethnoarchaeological studies of modern Near Eastern houses, households, families, and villages conducted by researchers such as Carol Kramer (1982) and Patty Jo Watson (1979). There is nevertheless a reluctance to make use of another rich and highly detailed resource in this regard. The physicality of everyday life within houses and households has been the subject of numerous detailed historical studies beyond the Near Eastern context. These studies are rooted in the materiality of existence and thus replete with potentially fruitful suggestions for ways to apprehend the complexities of the archaeological record with which we are faced, in particular in terms of its interface with real human (and animal/plant) activity and behavior. The pioneering work of Harriet Martineau (1837) on American society, more recent studies by David F. Hawke (1988) and Jack Larkin (1988) on everyday life in early America, Gertrude Jekyll's (1939) lavishly materialistic study of old English household life, and Isabel Grant's (1961) voluminous and socially engaged analysis of Scottish highland life-ways, are all examples of this sort of detailed, highly contextualized study.

The suggestion is not for any form of direct comparison or analogy between the materialities of these studied communities and those of our ancient Near Eastern houses and sites. Rather, it is suggested that, in the richly embedded materiality of these studies, there is something to learn about the astonishing continuities, often over centuries, of human practice in use of specific objects and types of objects. There is something to learn about the shifting or constant relationships between objects and human practices, about the potential causes of stability or sudden change in material traditions, about the enmeshing of relationships between people, plants, animals, and things in daily, seasonal, and annual cycles, and about the fundamental strangeness, to us, of many aspects of much apparently mundane life.

Finally, within house and household archaeology, there is scope for increased apprehension and application of ideas and theories developed within the broad field of social theory and, in particular, that branch concerned with social identity, for "without identity there could be no human world" (Jenkins 2004: 7). The house is a forum for the generation and negotiation of identities at the individual and communal level, as explored by many of the authors in this volume. Indeed, multiple overlapping and intersecting identities meet and contend with each other inside the house and the tension between a sense of individual identity and of community identity can be traced through the story of human occupation of the ancient Near East. These tensions were acted out in daily, seasonal, and annual dramas revolving around every aspect of life and death, and their dramas may manifest themselves in the recoverable material record. Perhaps the greatest challenge that lies ahead for the archaeologist of the house, home, and household is exploring and applying theories of social identity that maximize the contextually rich evidence available especially within the Near Eastern archaeological record. At the same time, archaeologists must provide suitably valid yet challenging narratives of the human past situated within a framework of deep ecological understanding. The papers in this volume certainly represent important steps along that road.

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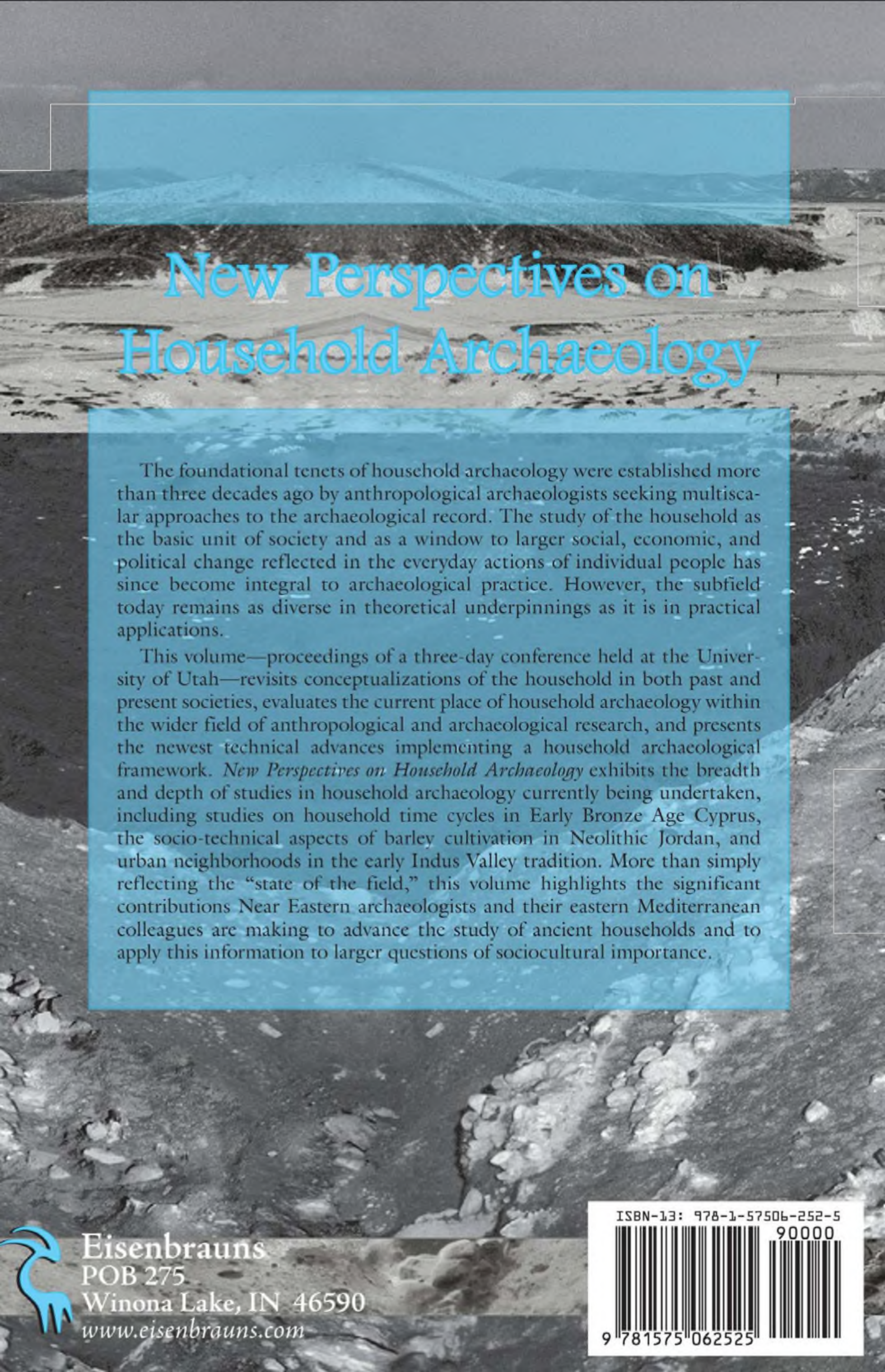

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The foundational tenets of household archaeology were established more than three decades ago by anthropological archaeologists seeking multiscalar approaches to the archaeological record. The study of the household as the basic unit of society and as a window to larger social, economic, and political change reflected in the everyday actions of individual people has since become integral to archaeological practice. However, the subfield today remains as diverse in theoretical underpinnings as it is in practical applications.

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